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ABSTRACT

This report describes the development, implementation, and evaluation of a prototypical Job-Oriented Reading Program (JORP) that stressed the acquisition and development of job-related reading skills for Air Force personnel. Design of the JORP included the special requirements that the reading grade level be set at 9.0, that student input reading grade level be 6.0 to 8.9, that JORP training be integrated in the duty day of personnel, and that time available for training be two and a half hours per day, five days a week, for six weeks. The JORP program was field-tested during 1976 at Travis Air Force Base, California. Data generated by the study indicated that there was a significant improvement in job-specific JORP test scores. Overall, the results were interpreted as indicating that the JORP is a valuable and feasible approach to job-specific reading training in the Air Force. (Author/AA)

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This report describes a study undertaken to respond more fully to the current literacy problems in the Air Force. This involved the development, implementation, and evaluation of a prototype Job-Oriented Reading Program (JORP) which stressed the *acquisition and development of job-related reading skills* for Air Force personnel. The two major objectives were (a) to demonstrate the feasibility of using a job-related approach to reading instruction with airmen in the Air Force training system, and (b) to test the effectiveness of this approach in an operational setting by using job-related reading materials to improve airmen's performance. Design of the JORP included special requirements that the reading grade level (RGL) of JORP be set at 9.0; student input RGL was from 6.0 to 8.9; JORP training was to be integrated in the duty day of the permanent party personnel; and time available

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for training was 2-1/2 hours per day for five days a week for six weeks. Two Air Force job career clusters were chosen for this effort: Maintenance and Non-Maintenance. Two instructional strands were developed. In Strand I, the students utilized their existing literacy skills to practice locating, extracting, analyzing, and comprehending job-related information from source material excerpted directly from job and training manuals. Instructional techniques emphasized individual practice, self-pacing, and written responses which utilized worksheets and tests in the four instructional modules of Narrative, Procedural Directions, Schematics, and Forms. Strand II was designed to improve basic reading and thinking skills, in addition to basic job concepts and vocabulary. Strand II source material was comprised of a series of passages written specifically for the JORP. Each package dealt with a different job content area and was written at a lower level of difficulty than the typical job reading materials. The instructional procedures for Strand II emphasized direct teacher instruction, group activities, discussion, and oral and graphic responses from the students. Tests were developed for student mastery and feedback in the Strand I work. Since Strand II student responses were neither right nor wrong, they were judged by the individual student, his peers, and the instructor in terms of appropriateness to the task at hand. The JORP prototype program was field tested during 1976 at Travis AFB, California. Data generated by this study indicated that there was a significant improvement in job-specific JORP test scores. Overall, the study showed the JORP to be a valuable and feasible approach to job-specific reading training in the Air Force.

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This final report was submitted by Human Resources Research Organization, 300 North Washington Street, Alexandria, Virginia 22314, under contract F41609-76-C-0001, project 1121, with Technical Training Division, Air Force Human Resources Laboratory (AFSC), Lowry Air Force Base, Colorado 80230. Captain Steven D. Groff, Instructional Technology Branch, was the contract monitor.

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This technical report has been reviewed and is approved for publication.

MARTY R. ROCKWAY, Technical Director
Technical Training Division

DAN D. FULGHAM, Colonel, USAF
Commander

SUMMARY

The Air Force has been successful at recruiting personnel with better than average abilities and literacy skills in past years. However, two considerations are worth noting. First, there have been occasions during which large surges of marginal ability persons have been introduced into the Air Force training system. Second, there are indications that accessions of Air Force recruits in a non-draft environment may periodically result in more personnel with lower abilities and literacy skills.

The Air Force has defined its literacy problem in terms of the gap between the reading demands of training and job materials and the reading skills possessed by the personnel who use those written materials. The two-pronged approach currently used to address this problem includes reducing the difficulty of the material on the one hand, and increasing the literacy skills of the individual on the other. However, each approach has its limitations. The strategy of reducing the reading difficulty of the written materials can only be carried so far without causing a distortion in the meaning and substance of the printed text. The strategy of increasing the *general* reading level of the airmen normally does not result in sufficient improvement in *job-related* reading skills to permit successful completion of the training or job task.

In order to respond more fully to the current literacy problems in the Air Force, the present study was undertaken. The purpose of this study was to develop and implement a prototype Job-Oriented Reading Program (JORP) which stressed the acquisition and development of job-related reading skills for Air Force Personnel. The two major objectives were:

1. To determine the feasibility of using a job-related approach to reading instruction with airmen in the Air Force training system.

2. To test the effectiveness of this approach in an operational setting for improving airmen's performance in using job-related reading materials.

The development of the JORP drew upon the experiences of a somewhat similar effort in the Army in functional literacy (FLIT). With that as a starting point, the special design of the JORP for the Air Force included the following design requirements: the reading grade level (RGL)

of JORP was set at 9.0; student input RGL was from 6.0 to 8.9; JORP training was to be integrated in the duty day of the permanent party personnel; time available for training was 2½ hours per day for five days a week for six weeks.

The two Air Force job career clusters chosen for this effort were maintenance and non-maintenance areas. The five Air Force Specialty Codes (AFSC) selected for the maintenance cluster were 421X2 - Aircraft Pneudraulic Repairman, 431X1A - Aircraft Maintenance Specialist, 431X1C - Aircraft Maintenance Specialist, 431X1F - Aircraft Maintenance Specialist, and 431X1E - Aircraft Maintenance Specialist. For the nonmaintenance JORP cluster the following three AFSCs were selected: 702X0 - Administration Specialist, 645X0 - Inventory Management Specialist, and 647X0 - Materiel Facilities Specialist.

Two instructional strands were developed. In Strand I the students utilized their existing literacy skills to practice locating, extracting, analyzing, and comprehending job-related information. The source material for Strand I was excerpted directly from job and training manuals. Instructional techniques emphasized individual practice, self-pacing, and written responses utilizing worksheets and tests. The four instructional modules were narrative, procedural directions, schematics, and forms.

Strand II was designed to improve basic reading and thinking skills, via basic job concepts and vocabulary. Strand II source material was comprised of a series of passages written specifically for the JORP. The passages each dealt with a different job content area and were written at a lower level of difficulty than the typical job reading materials. The instructional procedures for Strand II emphasized direct teacher instruction, group activities, discussion, and oral and graphic responses from the students.

Tests were developed for student mastery and feedback. These were most heavily used in the Strand I work. For Strand II work, the responses of the student were neither right nor wrong, in the sense that there was only one correct answer. Rather, the responses were judged by the individual student, his peers, and the instructor in terms of appropriateness to the task at hand.

The JORP prototype program was field tested during 1976 at Travis AFB, California. There were 85 male and 8 female students, with a mean age of 23 years and a mean entering RGL of 9.24. Forty five of the

students entered with RGL below 9.0. All students were assigned to Travis AFB on a permanent party basis.

For the Strand I instruction, the combined results (average) from the four instructional modules indicated that 8% of the students passed the pretest for the instructional module and advanced immediately to the next module; 60% failed the pretest and later passed the post test; and 32% failed the pretest and subsequently failed the post test. The overall average training effectiveness was 64%. It should be noted that those students who did fail both the pre- and post tests were moved on to other training modules despite the failing post test score. This was done to insure that all students were exposed to all training modules. Analysis indicated that had the instructional time been longer, fewer students would have failed the post tests. Of those students who failed the pretests, 38% failed because of inaccuracy and 46% failed because of inaccuracy and slow work (time). Thus, it seemed reasonable to conclude that, although most students do enter the JORP with some ability to perform reading tasks, they do show a need for additional training on the fundamental skills which are taught in the JORP.

The finishing RGL of the students was 9.65. This represents a gain of .41 in RGL. In terms of overall reading ability, this gain is not statistically significant. However, on the job-specific JORP test, the entry score was 33.4 and the exit score was 49.5. This gain of 16.1 points was significant ($p < .001$). Thus, important gains were made in job-specific reading literacy skills. These results should be viewed in light of the fact that 48 of the students already had reading ability at or above the 9.0 RGL. This fact tends to reduce the apparent impact of the JORP program with respect to RGL, even though the more able students seemed to improve in their job-specific skills as measured by the JORP Test.

The field test generated evidence that suggests that the job relevance of the content of the literacy training curriculum is an important and potent variable which will influence the effectiveness of the training program. Overall, the study showed the JORP to be a valuable and feasible training plan for job-specific reading training in the Air Force. If the JORP is to be implemented on an operational basis, it is suggested that several additional clusters be developed. Specifically, it is recommended that: (1) the present nonmaintenance cluster be split into a 70/73 administrative cluster and a 64 supply cluster, and (2) three additional clusters be developed to cover the 54/55 civil engineering, 81 security police, and 60 transportation areas. This would provide a total of six clusters for full JORP implementation, and would address most of the problem readers in the Air Force. The currently available maintenance and nonmaintenance JORP clusters could be used until these more specific additional clusters are developed.

PREFACE

The research described in this report was conducted by the Human Resources Research Organization (HumRRO), Alexandria, Virginia, under Air Force contract F-41609-76-C-0001. Captain Steven D. Groff, Air Force Human Resources Laboratory, Lowry AFB, Colorado, served as Contract Technical Monitor.

The research was conducted by HumRRO Western Division, Carmel, California, where Dr. Howard H. McFann is Director. Principal Investigator for the project was Mr. Kent Huff.

Members of the research team included Mr. Kent Huff, who contributed to all phases of the research work and writing of the final report, and was primarily responsible for the field evaluation and survey data collection phases, as well as the initial curricula development for Strand II of the Job-Oriented Reading Program (JORP). Mr. John Joyner had primary responsibility for the Strand I development, and for coordination and administration of the JORP field test, as well as considerable contribution to the field test evaluation. Dr. Thomas Sticht served as initial Principal Investigator and provided early planning support. Miss Wendy McGuire assisted in the data analysis for all phases of the study, and Mrs. Maurlaine Jorgenson was responsible for the overall preparation of the final report manuscript. In addition, Capt Steven D. Groff, Lt Sharon Slaughter, Dr. Ron Burkett, and Ms. Linda Waddelow actively participated in various phases of the work.

The research team would like to express its appreciation to Larry McCabe, the Director of the Base Education Office at Travis AFB, for cooperation in the conduct of the field test, and to Fred James of the McClelland AFB Education Office for cooperation during administration of the surveys. Special appreciation is extended to Mr. Mike Annala and Mr. Clifford Donahue of Travis PREP for their able assistance and effective contributions during the field test.

TABLE OF CONTENTS

	Page
Chapter 1 — Introduction	11
Air Force Approach to Literacy	11
Objective of the Present Effort	19
Chapter 2 — Development of the JORP	21
Differences Between JORP & FLIT	21
JORP Design Differences Based on FLIT Developmental Experiences	21
JORP Design Constraints Based on Air Force Requirements & Characteristics	22
Selection Criteria for JORP Clusters	23
Distinctions Between Instructional Strands	24
Strand I Development	26
Strand II Development	38
Instructional Philosophy & Background	38
Development of Strand II Job Reading Passages	41
Selection of Strand II Content	41
Writing Guidelines	44
Strand II Conceptualizing Activities	44
Strand II Instructional Approach	53
Chapter 3 — JORP Field Test	54
Selection of Students	54
JORP Assessment Instruments	55
Strand I Module Proficiency Tests	55
Job-Oriented Reading Program Test	56
Conduct of the Instructional Program	57
Schedule	57
In-Processing	57
Strand I	58

TABLE OF CONTENTS (Continued)

Page

Chapter 3 — JORP Field Test (continued)

Strand II 60
Out-Processing 60

Chapter 4 — Evaluation of the JORP Prototype 61

Characteristics of the JORP Student 61
Strand I Module Evaluation Data 70
Training Effectiveness of Module 70
Speed & Accuracy Criteria 73
Summative Evaluation of the JORP 75
JORP Test Part Score Gains 76
Sub-Group Comparisons of JORP Test Effectiveness. 77

Concluding Comments 83

References 86

Appendix A — Career Development Courses (CDC) 87

Description of CDC 87
Survey of Study Skills With CDCs 88
CDC Survey Sites & Student Characteristics 88
Findings of CDC Survey 90

Appendix B — Air Force Maintenance & Non-Maintenance Cluster Topic Charts 95

Appendix C — Strand II Job Reading Manual Topics 105

TABLE OF CONTENTS (Continued)

		Page
Appendix D —	Student Post Job-Oriented Reading Program Survey	110
Appendix E —	Supervisor's Job-Oriented Reading Program Survey	123

ILLUSTRATIONS

Figure		Page
1	Sample Page From Job Reading Manual, Narrative Section	29
2	Example of Narrative Worksheet	30
3	Examples of Procedural Directions Questions	32
4	Corresponding Procedural Directions Job Reading Manual Page	34
5	Example of Schematic Worksheet	35
6	Corresponding Schematic Job Reading Manual Page	37
7	Representation Transformation (RETRAN) Reading Training Procedure	40
8	Example of the Method for Selection of Content Areas for JORP Clusters	43
9	Student Examples of Iconic Presentations from the Same Narrative Passage	46
10	Student Examples of Classification Tables from the Same Narrative Passage	49
11	Student Examples of Flow Charts from the Same Narrative Passage	51
12	Flow Chart of Student Progression Through the Four JORP Modules	59

LIST OF TABLES

Table		Page
1	Essential Features of Current Reading Improvement Programs in the Air Force	15
2	Summary of Distinctions Between Strand I & Strand II	25
3	Ages & Education Levels of JORP Students	62
4	Entry Reading Grade Level (RGL) of JORP Students	63
5	Enlisted Grade of JORP Students	64
6	Ethnic Groups of JORP Students	65
7	Language Background of JORP Students	66
8	Distribution of Air Force Specialties (AFS) by Maintenance & Non-Maintenance Training Clusters	67
9	CDC Performance of JORP Students.	68
10	Percent of JORP Students Reporting Job Reading Tasks & Job Reading Problems	69
11	Reported Daily Job Reading Time of JORP Students and AFSs of Those Reporting No Job Reading	69
12	Strand I Module Performance	71
13	Percentage of Students Failing a Module Pretest for Reasons of Accuracy, Time, & Both Accuracy & Time	74
14	Mean Pretest Scores of Students Failing Module Pretests	74
15	Reading Performance of JORP Students	75
16	Overall JORP Test Raw Score Correct; Pre and Post Instruction	77
17	Pre and Post JORP Test Scores for Students Above & Below 9.0 RGL	78
18	Pre & Post JORP Test Scores of Students for Whom Training Materials Were Designed Versus All Other Students	78
19	Pre-to-Post JORP Test Score for All Maintenance & All Non-Maintenance Students	79
20	Comparison of Pre-to-Post JORP Test Scores of Maintenance Students from the 42 & 43 Career Fields to All Other Maintenance Personnel	80

LIST OF TABLES (Continued)

Table		Page
21	Comparison of Pre-to-Post JORP Test Scores of Non-Maintenance Students from Career Fields 64 & 70 to All Other Non-Maintenance Personnel . .	80
22	Pre-to-Post JORP Test Scores for Technical School Graduates & Directed Duty Assignees	81
A-1	Descriptive Characteristics of CDC Survey Interviewees	89
A-2	Study Time Devoted to Completed CDC Materials	90
A-3	Study Techniques Employed by Air Force & Navy Schools	91
A-4	CDC General Study Sequence Followed by Successful & Unsuccessful Students	91
A-5	Perceived & Actual Percentage of CE Questions Coming From the VRE Questions	92
A-6	Sources of Job Knowledge	93
A-7	Problems with CDC Materials	93

A JOB-ORIENTED READING PROGRAM FOR THE AIR FORCE: DEVELOPMENT & FIELD EVALUATION

Chapter 1

INTRODUCTION

Technological change places a premium on fundamental information processing skills, especially language and literacy. In highly complex and technology-based organizations like the Air Force, the literacy skills of personnel contribute directly to the capability to function effectively and efficiently in accomplishing the mission.

In the past, the Air Force has been successful at recruiting personnel with better than average abilities and literacy skills. However, there have been occasions (e.g., Project 100,000) during which large surges of marginal ability recruits have been introduced into the Air Force training system. In addition, there are indications that accessions of Air Force recruits in a nondraft environment will periodically result in personnel with lower abilities and literacy skills (Vitola & Valentine, 1970). This result could become especially acute when the U.S. economy is robust and civilian jobs are plentiful for higher ability personnel. Most recently, attendees at a World-Wide Air Force On-The-Job-Training (OJT) Conference (January 1974) expressed concern over the existence of reading problems among personnel and the detrimental effects these problems were having on the conduct of Air Force OJT.

Because the Air Force has long recognized the impact of literacy on training, job performance, and operating costs, it has funded numerous R&D efforts in this area. Burkett (1976) provides an excellent review of past literacy R&D activities in the Air Force.

AIR FORCE APPROACH TO LITERACY

The Air Force has defined its literacy problem in terms of the discrepancy or "gap" between the reading demands of training and job materials, and the reading skills possessed by the personnel who use those written materials (Mockovak, 1974). The general research thrust of the Air Force to reduce this discrepancy has been a two-pronged approach — one dealing with the simplification/modification of materials to reduce the reading demands of the printed matter, and the other to implement training programs aimed at increasing the literacy skills of the individual (Burkett, 1976).

Reducing the Difficulty Level of the Printed Materials

Reducing the difficulty level of the printed materials is an important approach in closing the literacy gap. However, this approach is limited to the extent to which the materials can be simplified before a degradation in the accuracy and completeness of technical information occurs. Further, this approach loses its appeal at the point where it becomes necessary to delete the more demanding job knowledge requirements to close the gap. The result can be to render a person useable only in a very limited job assignment. To have flexibility, a person must have the fundamental literacy/cognitive skills to adapt to new job demands as the situation may require.

Increasing the Reading Skills of Personnel

Currently, the Air Force provides reading improvement instruction to airmen scoring below certain screening test criteria at two different points in the training process: during basic training, and following duty assignment to the field. The programs at these two stages of training are independent of one another. The following paragraphs briefly discuss the essential characteristics of each program.

During Basic Training

At the time of this research, all Air Force enlistees are assigned to Lackland AFB, Texas for basic military training (BMT). A 15-minute reading test (designated RJS-1) is administered to all recruits. Non prior-service airmen who score below the sixth reading grade level (RGL) on the RJS-1, and all Mental Category IV personnel, regardless of their RJS-1 score, are given the California Achievement Test (CAT) reading subsection. Those airmen who score below the sixth RGL on the CAT are then assigned to the Reading Proficiency Unit. While assigned to the reading proficiency training program, trainees receive four hours of reading proficiency training and four hours of military training per day.

The first week is spent in a conventional classroom setting, working on word power and phonics. At the end of the week, a diagnostic test is administered and the results are used to guide the person's progress through the remaining weeks of the program. This latter portion of the course is self-paced and relies primarily on the SRA (Science Research Associates) Reading Series materials, although other materials are available. Once assigned to this unit, students receive reading instruction for a period of up to eight weeks. Throughout the training period, the

student can become eligible for early release from the reading program by progressing through the seventh grade level materials. At this point he is administered an alternate form of the CAT. If he demonstrates a sixth grade reading level on the CAT, he leaves the Reading Proficiency Unit and joins a basic training flight. If he does not achieve that criterion level, the airman remains in the proficiency unit and receives additional training. At the end of eight weeks, two courses of action are open for those who do not achieve the sixth grade level. Either they are discharged from the Air Force, or, if the situation warrants and the unit commander approves, they are maintained in the unit for two additional weeks.

The reading proficiency training program at Lackland AFB is administered, controlled, and funded by Air Training Command (ATC) through its operating budget. The reading instruction is oriented toward the improvement of the airman's *general* reading skills.

Base Level Reading Training

Upon completion of basic training, the airman may be sent to a resident technical school or straight to a directed duty assignment (DDA). With an operational assignment to the field, the airman enters the OJT system for upgrade training (UGT) to a fully qualified skill level in the job specialty. The Air Force dual-channel OJT system provides training for enlisted personnel to qualify in both the *job knowledge* and *job proficiency* required to perform duty in an Air Force specialty (AFS). Airmen are expected to increase their job *knowledge* primarily through a program of self-study (correspondence) of Career Development Courses (CDC) while acquiring job *proficiency* and experience by performing job tasks under supervision. This system requires that the airman be able to read and comprehend a large volume of training and job material.

The unit OJT administrator schedules all upgrade trainees who do not have a score of 60 or higher on the "general" aptitude scale of the Armed Service Vocational Aptitude Battery (ASVAB) or on the Airman Qualifying Examination (AQE) to take a reading test (normally the USAFI Achievement Test III). The airman is then tested for word knowledge and reading comprehension. Those who score less than the ninth grade reading level in either area are enrolled in a base reading improvement course concurrently with the job assignment and study of UGT materials. In addition, if an airman has demonstrated an inability to progress satisfactorily in UGT, he may be referred to the Base Education Office for testing. If the airmen score less than ninth grade level on word knowledge or reading comprehension they are enrolled in the local Base Education Office reading improvement course.

The reading improvement programs conducted for personnel at the base level are the responsibility of the Base Education Office. An Air Force survey of these programs has been reported by Mockovak (1974). Ninety percent of the 84 responding bases had reading improvement programs with a combined enrollment of 5,774 airmen during the period of April 1972 to 1 April 1973. Entry into a program was generally (83% of the bases) based on the criterion of an RGL of less than ninth grade, as specified in AFM 50-23; however, there was a wide variety of reading tests used for screening and evaluation within these programs.

Criteria for successful completion of the program were frequently not made explicit and appeared to vary considerably from base to base, although most expected the airman to achieve the ninth RGL by the end of the program. Time in these programs ranged from an estimated 24 classroom hours to 240 hours, with a mean of 76 hours.

The most common types of reading problems cited (55%) were the students' inability to read, comprehend, and pass their CDC material; problems cited less frequently were a lack of basic reading skills (28%) and English as a second language (11%). There was tremendous variation in the educational background of students from base to base, with the proportion of non high school graduates ranging from 5 to 100 percent of the student enrollment. Overall, non high school graduates averaged 50 percent of the student enrollment. The majority of the students were apparently in their initial job assignment (62% training for the 3-Skill Level); and another 25 percent were training for the 5-Skill Level. These students came primarily from ten career fields: 24.9% from Aircraft Maintenance (42 & 43), 11.9% from Civil Engineering (54 & 55), 11.2% from Transportation (60), 11.0% from Food and Fuel Services (62 & 63), 12.7% from Administration (70), 8.3% from Supply (64), and 3.9% from Security Police (81).

The majority of the base reading improvement programs were developed and taught by local colleges (43%) and high schools (25%). For the remainder, 28 percent were arranged and taught by independent contract personnel, and only four percent by Air Force personnel. Presumably, the extensive use of local colleges and high schools was related to the funding arrangements for many of these programs. Almost one-half (49%) of the programs were funded by the Veterans Administration, and 13 percent were paid for by the local school districts using state and federal funds. The remaining 38 percent were financed by the Base Education Offices.* Again, like the Reading Proficiency Unit at Lackland, the emphasis in these base level reading courses is on the improvement of the airman's *general* reading skills, rather than the development of *job-related* reading skills. Table 1 summarizes the essential characteristics of the two current Air Force Literacy Training Programs.

*Since early 1977, cancellation of the VA PREP Program has caused the Air Force to fund all these programs under Program IDEA.

TABLE 1. ESSENTIAL FEATURES OF CURRENT READING IMPROVEMENT PROGRAMS IN THE AIR FORCE

FEATURES	BASIC TRAINING	PERMANENT DUTY STATUS
Site of Training	Lackland AFB	Permanent Duty Station, Base Education Office
Enrollment Criteria	Mandatory enrollment for all Mental Category IV airmen and others scoring below 6.0 RGL on the CAT.	1. Mandatory enrollment for all airmen with a general aptitude score of 60 or below who score below 9.0 RGL on either part 1 or 2 of USAFI-III or comparable test. 2. Mandatory enrollment for airmen identified as having reading difficulties in UGT and who score below 9.0 RGL on either part 1 or 2 of USAFI-III test.
Training Status of Attendee	In basic military training.	In skill upgrade training (UGT) to 3 or 5 Skill Level.
Length of Training	Variable - up to 200 hours. Trainee leaves reading training when he attains 6.0 or higher RGL.	Variable - from 24 hours to 240 hours depending upon course length established by Base Education Office.
Program Evaluation	California Achievement Test is used to assess attainment of sixth grade reading level. Test is administered when the student completes all 7th grade material or the end of 8 weeks, whichever comes first.	Variable. Most bases use attainment of 9.0 RGL as measured by USAFI Achievement Test III or equivalent. Others focus on such measures of success as increased student motivation, increased reading rate, improved vocabularies, passing of H.S. GED, and test/retest increment gains. Measurement instruments vary from base to base.

TABLE 1. ESSENTIAL FEATURES OF CURRENT READING IMPROVEMENT PROGRAMS IN THE AIR FORCE (Continued).

FEATURES	BASIC TRAINING	PERMANENT DUTY STATUS
Program Delivery System	Student is assigned to reading proficiency unit for up to 10 weeks.	Students are enrolled in available improvement courses at Base Education Office. Training is concurrent with UGT. The airman is released from duty to attend course, but is assigned to a job position against the unit manning documents.
Program Emphasis	General reading skill improvement to the 6.0 RGL. Primarily a self-paced program with intermittent criterion checks.	General reading skill improvement to the 9.0 RGL. Variable program from base to base at the discretion of instructor and Base Education Office.
Objective	Trainee to attain a reading ability of 6.0 RGL.	Varies from base to base, with 80% of bases specifying the 9.0 RGL attainment by attendees.
Administration of Program	HQ Air Training Command (ATC) active-duty AF personnel make up instructional and administrative staff.	Base Education Office arranges for conduct of reading improvement courses. The following percentages show those taught by local colleges (43%); local high schools (25%); independent contract instructors (28%); and AF personnel (4%).
Instructional Materials	Primarily uses the SRA Better Reading Books, Reading Laboratory & Pilot Laboratory Series, & Reader's Digest skill level builders. Consists of self-contained, programmed workbook material, with multiple-choice comprehension tests over previous major segments. Graded difficulty levels.	Specified by the agency conducting the training. Course content varies from base to base at the discretion of the instructor teaching the course.

TABLE 1. ESSENTIAL FEATURES OF CURRENT READING IMPROVEMENT PROGRAMS IN THE AIR FORCE (Continued).

FEATURES	BASIC TRAINING	PERMANENT DUTY STATUS
Funding Source(s)	ATC operating funds.	Financed through a variety of sources: Veterans Administration (VA) PREP (49%)*, Base Education Office (38%), Local School District (13%).

*See note page 14

Conclusions Regarding Current Air Force Reading Improvement Instruction

Drawing on the information obtained in his survey, Mockovak (1974) concluded that:

1. There were significant numbers of Air Force personnel who needed and were enrolled in reading improvement programs at their permanent duty stations.

2. The Air Force lacked a systematic, standardized, systems-oriented approach for dealing with reading training problems.

3. Each base had its own program, resulting in a "myriad of approaches, varying course lengths, different definitions of successful student performance, diverse financing and teaching methods, and inadequate records concerning student problems, personnel data, and progress."

In addition, Mockovak questioned the extent to which improvement in *job-related* reading could be expected from programs geared to develop reading skills in the context of *general* educational development. Information obtained in the survey indicated that the most common complaint centered on the difficulty individuals had in comprehending and successfully completing CDC materials. Individuals enrolled in reading improvement programs tended to have reading skills averaging slightly below the 9th grade level. Thus, even if the General Educational Development (GED) programs raised reading skills to the 9th grade level (the objective for present Air Force reading programs), the student would still be faced with the problem of having to learn the specific vocabulary and concepts contained in CDC materials before being able to perform at a new, improved, general reading level.

The above-noted limitations of the Air Force's current literacy training programs highlighted the need for Air Force development of a job-related reading program as opposed to the general reading programs currently available at Air Force bases. Such a program would be different in two distinctive ways from a general reading training approach — namely, the focus of the training on job reading tasks, and the use of Air Force training and job materials as the resource bases for developing reading improvement course content.

Much behavioral science research has indicated that learning is more likely to transfer from the school to the job situation when the school tasks closely resemble the job tasks. In the context of reading training, this requires an identification of job literature and an anal-

ysis of its reading task demands; thus, job reading improvement training should emphasize extraction of job-related information from print when the information is presented in the special formats and organizational styles characteristic of printed materials *used on the job*.

A job-related approach also requires the use of actual job and training printed matter as the resource base upon which reading improvement training activities are based. It is from an analysis of job-specific literature, such as Air Force manuals, regulations, technical orders, pamphlets, career development course (CDC) materials, and specialty training standard (STS) study references that the specific technical vocabulary and reading tasks are delineated.

OBJECTIVE OF THE PRESENT EFFORT

In response to the induction of marginally literate personnel under Project 100,000, and the recognition of the limited success of previous literacy programs, Department of Defense sponsored a series of research projects to:

1. Study and develop methodologies for determining functional literacy levels of military jobs within the Army.

2. Determine functional literacy levels for six major military occupational specialties (MOS) into which large numbers of marginally literate persons are apt to be assigned.

3. Develop a prototype literacy training program designed to provide a level of functional literacy appropriate to present <u>minimal</u> MOS reading requirements.

In view of this research (Sticht, 1975) the Air Force sponsored an effort to adapt and apply a job-related literacy approach to Air Force literacy training needs.

The purpose of the present effort was to develop and implement a prototype JORP which stressed the acquisition and development of job-related reading skills for Air Force personnel. Its major objectives were:

1. To demonstrate the feasibility of using a job-related approach to reading instruction with airmen in the Air Force training system.

2. To test the effectiveness of this approach in an operational setting for improving airmen's performance in using job-related reading materials.

The work effort was accomplished in two major phases; the first being the design and development of the instructional materials (JORP), and the second being the field test and evaluation of the instructional effectiveness of the JORP curriculum materials.

Chapter 2

DEVELOPMENT OF THE JORP

DIFFERENCES BETWEEN JORP AND FLIT

As mentioned earlier, the Army sponsored the development of a functional literacy program (FLIT) to increase individuals' functional literacy to a level appropriate to minimal MOS (Military Occupation Specialty) reading requirements. The present project was intended to adapt the FLIT methodology and procedures to personnel experiencing reading difficulties in the Air Force. The following paragraphs point out the major differences from FLIT and the constraints that were operating during the development of JORP that influenced the design of the instructional materials. Refer to Sticht (1975) for a thorough description of curriculum development for FLIT. The Army is operating the Advanced Infantry Training Preparatory Training (AITPT) School as the current implementation of the FLIT model developed by HumRRO.

JORP Design Differences Based on FLIT Developmental Experiences

A major feature of FLIT was the use of actual Army technical publications as the resource base for developing instructional materials. While this characteristic is a desirable instructional feature for job-related reading training, it did present some operational problems in the administration of the school. First, there was considerable difficulty concerning the Army publication distribution system's capability to service the large volume requirements of an operating school. A second, and more serious problem arose as the information in the technical publications was superseded, rescinded, added to, or otherwise changed. A single change in a manual necessitated multiple changes to keep the FLIT materials current.

In order to overcome these difficulties while preserving the use of actual job information as a resource base for JORP, it was decided to excerpt pages from Air Force technical publications upon which reading instruction activities could be based. These excerpted pages were then bound together in a single document and made a reference source for students to use in completing their reading training activities.

During the FLIT implementation in the Army, it was feasible to integrate the job-reading training and job skills training in a technical training school environment (Sticht, 1975). While this necessitated some changes in the way the FLIT program operated, student performance on the Job Reading task tests was approximately equivalent to that under other delivery systems, even though the time available for job-reading training was shortened. A concern of the Air Force was that the job-reading program

be integrated in the present training system with as little disruption as possible. This concern meant that the course could not be implemented at technical school, and that the time available for the JORP reading improvement effort would be limited, since the student would have to be released from his regular duty assignment to attend the job-reading class.

Because of this time constraint in the Air Force, the FLIT program was adapted in several ways to suit Air Force needs. Two instructional modules were deleted from the six modules in the FLIT program. These were the modules dealing with skill practice in the job-reading tasks of using a table of contents and an index. It was felt the students coming to the Air Force program would probably benefit least from practice in these modules, as their expected entry skills would probably be adequate to meet these demands of the job. Additionally, the languaging activities of FLIT were deleted, because it was decided that conceptualizing activities would be more beneficial to the Air Force students.

JORP Design Contraints Based on Air Force Requirements and Characteristics

Several additional adaptations of the FLIT design were necessitated by the following requirements and characteristics of the Air Force.

1. The reading training goal of FLIT was a 7.0 RGL, while the objective of JORP was to be a 9.0 RGL, as specified in AFM 50-23.

2. The student input RGL was below 6.0 for FLIT and expected to be between the 6.0 and 8.9 RGL for JORP. In addition, Air Force students who were unsuccessful in completing career correspondence training because of reading difficulties were to be eligible for the JORP training.

3. The FLIT training was provided prior to assignment to a technical training course, whereas in the JORP, the training was to be integrated in the duty day of permanent party personnel already on the job.

4. The time available for reading training in FLIT was 6½ hours per day for five days a week for six weeks (195 hours), while the maximum JORP training time was that available under the ongoing reading improvement program at the selected field evaluation site. This time was later determined to be 2½ hours per day for five days a week for six weeks (75 hours).

SELECTION CRITERIA FOR JORP CLUSTERS

The scope of the work effort was limited to the development of a prototype job reading program that could be applied to two broad classes of Air Force job career clusters, namely maintenance and non-maintenance areas. In selecting suitable career fields for inclusion in each cluster, the following factors were considered.

1. Two candidate career fields should come from a maintenance job cluster; i.e., from jobs dealing primarily with maintenance functions (inspecting, repairing, servicing, troubleshooting, and replacing) of "hard" aircraft and aircraft equipment. These career fields should make extensive use of Air Force technical orders.

2. Two candidate career fields should come from a non-maintenance job cluster; i.e., from jobs encompassing administrative functions (preparing, controlling, distributing, and maintaining documents) associated with many types of paperwork and "soft" systems procedures in the Air Force.

3. The candidate career fields should have a large number of job incumbents, and be well represented at almost any Air Force base (AFB). This was necessary so that a sufficient sample of subjects could be drawn for the tryout and field test of the JORP at one AFB. Also, the larger the career fields in absolute numbers, the better, since the prototype would apply directly to a greater number of people.

4. The candidate career fields should have sufficient numbers of low ability readers who have been identified, or could be identified, as having reading difficulties with Air Force job and upgrade training reading tasks, so that a sufficient sample size could be obtained during the field test.

5. The candidate career fields should have a sufficient "literacy gap" (i.e., the discrepancy between the job reading skills of job incumbents and the reading requirements of the career field). It would be of little utility to develop a JORP for a career field wherein no need existed because the job incumbents were adequately accomplishing the reading tasks.

The above selection criteria required data concerning the number of airmen assigned in the different Air Force specialty codes (AFSC), the extent of the literacy gaps in Air Force career fields, and the number of airmen who have been identified as having reading difficulties by career field. The most recent and relevant data pertaining to this area is that reported in Mockovak's series of reports (Mockovak, 1974, 1974a,

1974b). These data provided the basis for selection of the source materials to be included in each prototype JORP cluster.

For the non-maintenance JORP cluster, three AFSCs were selected: 702X0 - Administration Specialist, 645X0 - Inventory Management Specialist, and 645X0 - Materiel Facilities Specialist. For the maintenance cluster, five AFSCs were selected: 421X2 - Aircraft Pneudralic Systems Repairman, 431X1A - Aircraft Maintenance Specialist (Reciprocating Engine Aircraft), 431X1C - Aircraft Maintenance Specialist (Jet Aircraft, One and Two Engine), 431X1F - Aircraft Maintenance Specialist (Turboprop Aircraft), and 431X1E - Aircraft Maintenance Specialist (Jet Aircraft, Over Two Engines).

DISTINCTIONS BETWEEN INSTRUCTIONAL STRANDS

As in the FLIT program, the JORP materials were developed in two major strands. Although both instructional strands of the JORP trained airmen to locate, analyze, and comprehend job-related information, the two strands used different approaches. In the Strand I portion of the program, students use their existing literacy skills to practice specific job-reading tasks. In Strand II, they developed and improved basic reading and thinking skills. In addition, Strand II directly presented job concepts and vocabulary. Other distinctions between the strands are summarized in Table 2.

Inasmuch as Strand II demands more basic reading skills, it appears to be preparation for Strand I. Actually, the two strands are taught side-by-side throughout the program, thus reinforcing and complementing each other. Strand I exercises enable students to practice basic reading skills on specific job-reading tasks; Strand II exercises increase the students' knowledge of job concepts and vocabulary, while strengthening the base on which the job reading skills rest. A description of the characteristics of each instructional strand, and the development procedures employed in each strand is provided in the following paragraphs.

TABLE 2. SUMMARY OF DISTINCTIONS BETWEEN STRAND I & STRAND II.

	STRAND I	STRAND II
STUDY	Emphasizes individual practice, with very little direct instruction.	Uses group activities primarily, with direct instruction from the teacher, as well as group discussion and feedback. It is not self-paced.
STUDENTS' RESPONSES	Nearly all written. (Answers on worksheets and tests.)	Primarily oral and graphic. (Group discussions of student's charts, drawings, and tables.)
SOURCE MATERIAL	Excerpted directly from job and training manuals.	A series of passages written specifically for the JORP, each one dealing with a different job content area. Moreover, these passages are deliberately written at a lower level of difficulty than typical job reading materials.
PRESENTATION OF CONCEPTS & VOCABULARY	Presented to the extent of occurrence in the extracts for technical orders, manuals, etc.	Makes a more deliberate presentation via the content of the Job Reading Passages and the conceptualizing activities required of the students.
STUDENT FEEDBACK & EVALUATION	Criterion-based and objective. (Answers to questions on worksheets and tests.)	Subjective. Primarily the responses to a student's work by his peers in group discussion. There are no absolutely right or wrong answers, rather, varying degrees of sophistication at conceptual activities.
TESTS	Timed, as reflected in the passing criteria.	There is no timed work in this strand.
CHARACTER OF ACTIVITIES	Analytic. This strand requires the student to break the content of what he is reading down to bits of information small enough to serve as answers on tests and worksheets.	Synthetic. This strand requires the student to put together bits of information from a whole passage or paragraph to make a complete chart, table, or drawing on a particular subject.

Strand I Development

The purpose of Strand I is to improve the student's skill at four reading tasks typically encountered in job training and on the job. This approach is based on the premise that the student comes to the program already equipped with such basic reading skill as decoding. The Reading Proficiency Unit at Lackland AFB graduates students at the 6th RGL, so the JORP was aimed at airmen at the 6th through 9th RGL. Strand I emphasizes the application of existing literacy skills to examples of typical Air Force job reading and training materials. The following six instructional principles directed the development of Strand I. All of these have been used with success in other educational and training situations, including project FLIT.

- Individualized Instruction — The students progress at their own rate, using materials from their own career cluster.
- Performance-Oriented Instruction — The students perform the kinds of reading tasks encountered in job training and on the job. Thus, there should be a direct transfer of the skills learned in the JORP to the job itself.
- Functional Instruction — The students, ideally, use actual job-reading material, not general reading materials, and thereby should see the purpose of training in terms of job proficiency.
- Student-Assisted Instruction — The students may participate as administrative aides and peer instructors to relieve pressure on teachers and to reinforce what they have just learned.
- Programmed Instruction — The students advance through linearly programmed modules according to their performance on proficiency tests. Each module has branching loops for remedial instruction.
- Quality-Controlled Instruction — The students should develop mastery of the reading task before proceeding to the next module.

To put these principles into operation, the JORP uses the following materials in the classroom: (1) Proficiency Tests, (2) Worksheets, (3) a Job Reading Manual of source material, and (4) a Student Control Card. The first three are used by the student to practice job reading skills; the fourth is used by the teacher to keep track of the student's progress and determine what the student should do next. In developing all of these materials, three guidelines were used.

1. Strand I should concentrate on the skills of *extracting* information, leaving to Strand II the practice of drawing inferences and conclusions and making generalizations.

2. The materials should apply to the principles and procedures that Air Force workers and first-line supervisors are expected to know and use for their jobs. Information addressed to higher levels of command should not be included.

3. The readability of the worksheets should be near the 9th reading grade level.

The student in Strand I practices each of the job reading skills identified below in a separate module of instruction, and passes from one module to the next as a result of performance on proficiency test. Whenever the students fail a proficiency test, they complete a set of worksheets.

The *Narrative* module provides practice at extracting information from narrative prose in a manual, such as the operating principles of an aircraft engine, or a list of safety rules. Figure 1 shows a typical page from a Job Reading Manual narrative section. A typical question asked is: "According to the written information on page 47, where does the integral brake system obtain braking power?". For an example of a complete Narrative worksheet, see Figure 2.

The *Procedural Directions* module provides practice at extracting information from procedural directions, like the instructions for completing a pre-flight check. It differs from the Narrative module in two respects. First, the source material in the Job Reading Manual for Procedural Directions always presents a *sequence* of steps that must be done in a particular order. Even though some Narrative excerpts deal with operational procedures they are not the step-by-step directions for accomplishing the job.

Second, there is one type of question found only in the Procedural Directions modules. This type requires the student to rearrange into correct sequence a series of operational steps that are presented out of order on the worksheet. Other Procedural Directions questions are similar to those in Narrative. Examples of both are found in Figure 3. Figure 4 shows the corresponding Job Reading Manual page.

The *Schematics* module differs from Narrative only in the type of source material used for the Job Reading Manual. Tables, graphs, charts, maps, drawings, diagrams, etc., are referred to by the student to answer such questions as, "Use the graph in Figure 5-11 to tell how much you will tighten the LBGG cable when the temperature is 80° F." Note, incidentally, that this question deals with an operational procedure (trimming the flight control cables), but that it is not appropriate for the Procedural Directions module because there is no *sequence* involved. Figures 5 and 6 illustrate a Schematic worksheet and the corresponding Job Reading Manual excerpt, respectively.

l. When the signal is given, gradually increase the engine power setting until the aircraft starts to move.

8-4. After the aircraft starts to move, back off on the throttle to maintain a low, safe taxi speed. Reduce this speed to 10 miles per hour in congested areas and to even lower speed in areas that have loose gravel, ice, snow, or sand, and remember to slow the aircraft down before starting a turn.

8-5. In taxiing, the aircraft is turned with the nosewheel steering system if so equipped. To start each turn, first make only a slight change in heading. Then gradually increase the change in heading until you get the desired rate of turn. Use the same technique coming out of the turn in order to avoid sudden changes of direction that put unusual stesses on the nosewheel.

8-6. Improper use of brakes during taxiing also places severe stresses on the aircraft. To use the brakes correctly, first depress the pedals to obtain a reasonable rate of deceleration. Then, as the aircraft slows down, gradually release the brakes so that you are applying very little braking pressure when the aircraft stops.

8-7. Now that you know how to use the brakes, let's point out a few don'ts for taxiing. Here they are:

a. Unless you are on an established taxiway, don't taxi an aircraft within 100 feet of an active runway.

b. Don't taxi within 10 feet of any obstruction.

c. Don't taxi at night with the aircraft lights off.

d. Don't use aircraft lights in such a way as to blind ground crewmen.

e. Don't open aircraft doors or hatches during taxiing.

f. When moving from a row of parked aircraft, don't use excessive engine power. (Use the least amount of power that produces forward movement.)

8-8. So far in our discussion of taxiing, we have considered the work done by the man in the cockpit. Now let's turn our attention to the work done by the ground crew.

8-9. *Ground crew duties.* Before an aircraft enters or leaves a ramp, a taxi signalman is required to direct its movement. Let's see what he does.

8-10. The taxi signalman stands in front of the aircraft. His position should be so that he is within sight of the pilot and to the left of the aircraft. In this position he can see the eyes of the pilot at all times, and the pilot can see all signals that are given by him.

8-11. The taxi signalman uses signals like those used for towing. Some of these signals have already been illustrated and discussed in the text. For a review of the signals, refer to figure 6 and to AFR 60–11.

8-12. Next let us consider the work done by members of the ground crew other than the signalman.

8-13. In some instances during taxiing, ground crewmembers may act as wing walkers or flagmen. Wing walkers are required if an aircraft will be taxied within 25 feet of an obstruction or if the aircraft to be taxied is not a locally based one. In addition, after the landing of an aircraft that is not locally based, a flagman or a "follow me" vehicle usually will direct the craft to the appropriate parking area. Once the aircraft reaches the parking area, however, a maintenance specialist usually takes over as signalman and directs the parking of the aircraft.

8-14. Parking. When you park an aircraft, the procedures that you use depend upon whether you are parking it for a few hours (temporary parking) or overnight (extended parking). Another determining factor is whether or not extreme weather conditions exist. The following information on parking is limited, primarily, to the C–123 aircraft.

8-15. *Temporary parking.* The –2 TO (or equivalent) provides you with gross weight versus wind velocity graphs similar to the one illustrated in figure 7. (If a graph is not provided, wind velocity limits are given.) The graph determines whether you can park the aircraft or must moor it. Notice in figure 7 that as long as the gross weight versus wind (or gust) velocity values are within area A, you can safely park the aircraft. Otherwise, you must apply one of the appropriate mooring tiedown procedures. To park the C–123, observe the following general procedures, which are applicable (with slight variation) to most aircraft:

a. Position the aircraft to provide clearance for maintenance, servicing, and fire lanes and, whenever possible, with at least a 20-foot wingtip distance from other airplanes.

b. Don't park the airplane closer than 750 feet from the centerline of landing strips.

c. Don't park the aircraft in line with the ends of landing strips within 1,600 feet of parking strip ends.

d. Don't park the airplane closer than 250 feet from the farthest edge of connecting taxi strips. If you ever find it necessary to temporarily park an aircraft with any part of it extending into a taxiway, station an observer to warn oncoming traffic. At night the observer should be equipped with a suitable light; during the day, with a suitable flag.

e. Whenever possible, head the airplane into the wind..

Figure 1. Sample Page from Job Reading Manual, Narrative Section

NAME _____ M N5

Page 24 contains written instructions for taxiing and parking the aircraft. You will be better able to perform your job if you are good at using instructions presented in written form like this. Tell how you would respond in the following job situations.

1. You, as a taxi signalman, are helping to park the aircraft. Where do you stand?

_____

_____

2. Why do you stand in this particular position?

_____

_____

3. You have qualified to taxi the aircraft. How close to an obstruction can you safely taxi?

_____

_____

4. You are leaving a row of parked aircraft. How much engine power do you use? (Reference: paragraph 8-7.)

_____

_____

5. You have finished taxiing the aircraft, and you are deciding whether to park it or moor it. What two things do you need to know to make your decision?

_____

_____

Figure 2. Example of Narrative Worksheet

N5

6. You are forced to park the aircraft temporarily with a wing tip extending into a taxiway. What precaution do you observe? (Refer to para 8-15d.)

_____

_____

7. You are taxiing the aircraft through a congested area, on a dry concrete taxiway. How fast can you safely go? (Reference: paragraph 8-4.)

_____

_____

8. You are teaching a trainee the proper taxi signals to use when he works on the ground crew. Where can he look up an illustration or more information about the signals? (Reference: paragraph 8-11.)

_____

_____

9. You are the chief of a ground crew about to taxi the aircraft. How do you decide whether or not you need any men on your crew to be wing walkers? (Reference: paragraph 8-13.)

_____

_____

10. While you are taxiing the aircraft, why is it so important to use the brakes properly? (Reference: paragraph 8-6.)

_____

_____

Figure 2. Example of Narrative Worksheet (continued)

NAME_____ NM-PD18

In this job situation you are an administrative specialist establishing requirements with the Publications Distribution Center to meet the needs of your PDO customers. Page 36 contains procedures you can use to establish requirements for publications with PCD.

1-6 In what order will these job tasks be done?

_____ Report customer requirements to PDC on AF Form 764.

_____ Prepare AF Form 574 for each publication required.

_____ Advise customer of deadlines for submission of requirements.

_____ Record requirements on AF Form 574 as they are received.

_____ Consolidate all your customers' requirements.

_____ Distribute A F Publications Bulletin (PB) to all customers.

7. What four steps will you do to validate customer requirements?

_____

_____

_____

Figure 3. Examples of Procedural Directions Questions

NM-PD18

8. What will you do with AF Form 764A after recording a customer's requirement?

_____

_____

9. What will you base your requirements on for an "M" series publication to PCD?

_____

_____

10. What will you do with each AF Form 574 prepared for each F-type publication required by customers?

_____

_____

Figure 3. Examples of Procedural Directions Questions (Continued)

Publications Requirements. To establish requirements for publications with the Air Force Publications Distribution Center (AFPDC), you, the PDO, must take the following basic steps. These basic steps apply to publications with the distribution symbols M, B, S, and F.

Step 1. Distribute the Air Force Publications Bulletin (PB) to *all* of your customers. Advise them at the same time of any deadline or other special instructions for submitting their requirement to you.

Step 2. Prepare a separate AF Form 574, Distribution Record, for each publication announced in the PB for which requirements must be established.

Step 3. Record your customers' requirements individually on the applicable AF Form 574 as they are received. After recording your customers' requirements, you may either destroy their AF Form 764a or keep them on file to substantiate your own records.

Step 4. Consolidate *all* your customers' requirements, adding appropriate quantities for stock, and report them to the PDC on AF Form 764.

Allowable stock quantities to be added to your customer requirements may be found in Chapter 3 of AFM 7-1.

Validation. After your customers' requirements have been received, it is your responsibility to insure that:

- The publications are needed by that organization.
- The request is properly filled out according to AFM 7-2 and signed.
- The distribution symbol of the publication applies.
- Functional statements apply to that organization.

Series distribution (M, B, and S). Customers must submit requirements to you on their own initiative. You must insure that your customers understand that series distribution publications are announced in Section II of the PB. Customers will submit requirements to you on AF Form 764a for each publication they want in a particular series, showing the appropriate symbol in the space provided on the form.

Customers should not submit requirements for publications with M or B distribution symbols unless their organizations are authorized to receive these publications. Futhermore, they should *not* resubmit requirements for any publication for which they have already established requirements.

Unlike your customers, you cannot establish requirements with the PDC by individual regulations in a series. You must establish requirements for the entire series.

You can usually base your requirements for a particular series (M, B, or S) on the sum of your customers' requirements for the "MOST WANTED" AFR in the series. This, however, is not always true. If using the "MOST WANTED" rule results in your receiving an excessive number of other regulations in the series, you must:

- Reduce your series requirements as low as you can without creating a shortage in your initial distribution (ID) requirements.
- Requisition the extra copies you need to complete ID of a publication when it appears in Section II of the PB. Identify the publication on your requisition by adding the suffix (BP) to the short title.

The (BP) represents that the item is being processed. Your (BP) requisition will be held on back order at the PDC and filled as soon as stock is received from the printers.

Functional distribution (F). Functional-type publications are treated the same as series type except you set a specific date for your customers to report their requirements. The AF Form 574, prepared for each of these publications, is placed in suspense until you receive your customers' requirements. Once you receive you customers' requirements, you follow the same basic steps as for series distribution publications. Be sure to check AFM 7-1 for the stock quantity to be added.

Figure 4. Corresponding Procedural Directions Job Reading Manual Page

NAME _____ M S15

In this job situation you are rigging the aircraft brake control cables. Figure 5-11 on page 7 presents, in schematic form, information that you need. Use Figure 5-11 to tell how you would do the following job tasks.

1. The temperature today is 100°F. At what tension will you rig the LGBB cable? _____

2. What does the LGBB cable do? _____

_____

3. You are handling a cable with a Yellow-White-Brown color code. What does it do? _____

_____

4. You find an LGBA cable is tightened to 120 pounds, and you know that the temperature is 50°F. Do you tighten or loosen it? How much?

_____

5. Which cables are pulled forward when the pilot applies the brakes?

_____

6. Which cable moves aft if the copilot releases the brakes?

_____

7. You are looking at the cable that is furthest to the left side of the aircraft. What color code is it? _____

Figure 5. Example of Schematic Worksheet

S15

8. You need to tighten the LCBB cable from the pilot (left side of aircraft) to the quadrant near the forward main gear bulkhead. How many turnbuckles are in that cable that you could use to adjust tension?

_____

9. If the temperature today is twenty below zero, how tight will you rig the cables?

_____

10. What does the cable run through in the bulkhead forward of the forward main gear bulkhead?

_____

Figure 5. Example of Schematic Worksheet (continued)

CABLE CODE	CONTROL CABLE	FUNCTION	COLOR CODE	POSITION SHOWN	CABLE DIA	CABLE CONSTRUCTION
LGBA	Landing Gear Brake	Brake Off	Yellow-White-Brown	Brakes Off	1/8 Inch	7 x 19
LGBB		Brake On	Yellow-White-Light Green		1/8 Inch	7 x 19

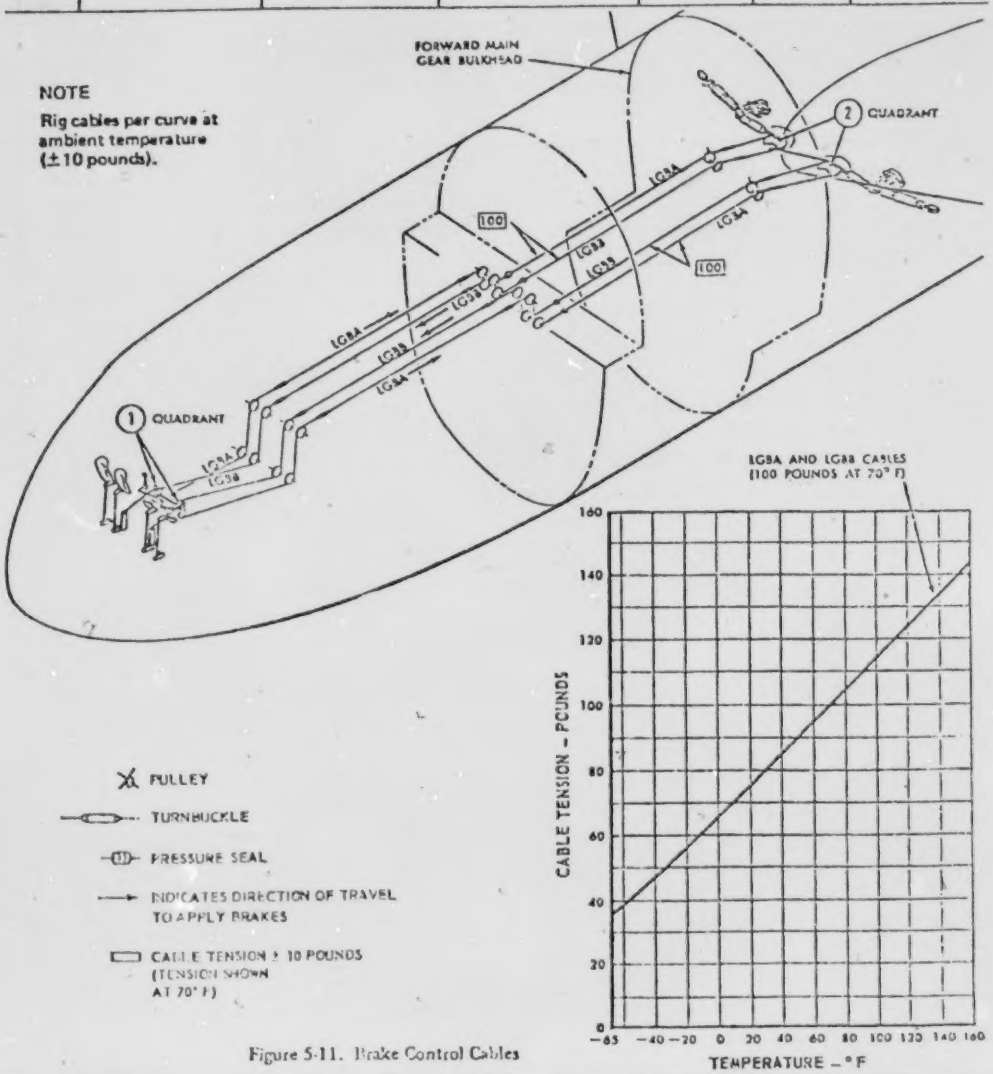


Figure 5-11. Brake Control Cables

Figure 6. Corresponding Schematic Job Reading Manual Page

The *Forms* module provides practice at following one kind of procedural directions: how to prepare Air Force forms. In addition, it familiarizes the airman with the format of forms. The worksheets in this module lead the student step-by-step through the written directions for filling out four different Air Force (AF) and Air Force technical order (AFTO) forms. The emphasis is on close reading of the instructions in order to be able to make the correct entries on the form when presented with a hypothetical job situation.

A typical worksheet was developed by first selecting a page from a CDC or job manual that provided practice at locating and understanding job-related information. Such a page would ordinarily deal with only one tpoic, such as how to jack an aircraft for weighing or how to requisition publications. Questions were then written that encouraged or required reading in different parts of the page, but which discouraged aimless "skimming". The questions emphasized extracting specific information from the passage. Questions which required a high degree of inference from the passage as a whole were avoided.

Strand II Development

Strand II of the JORP is designed to improve basic reading and thinking skills by providing instruction in reading and comprehending specially prepared job-related printed materials. The major instructional tool used to achieve this goal is a series of exercises that require the student to make representational transformations from narrative descriptive passages that present important job concepts.

Instructional Philosophy & Background

Humans have developed a unique system for transferring knowledges to each other by language. Both speaking and writing are processes for representing thoughts in external displays, which people can decode to form internal displays called conceptualization. Besides the linguistic modes of spoken and written displays, there are other methods for representing conceptualizations externally. For instance, we can draw pictures, or produce gestures or bodily postures. Or we can externally represent thoughts through a combination of linguistic and non-linguistic representations, such as figures, graphs, tables, et cetera.

Representational modes can be classified into three categories: linguistic, iconic, and schematic. Linguistic representations include speech and writing; iconic representations use pictures to represent

conceptualizations; and schematic representations include classification tables and flow charts, which contain iconic structural features and also linguistic signs like labels and short phrases. There are other modes, of course (e.g., graphs, in the schematic category) but the JORP deals only with these three modes of representation.

The different representational modes are ways to display information. When information is presented to a person, it might be in one of these three categories — linguistic, iconic, or schematic. Whoever attends to the information display — receiving the information as input — can, in turn, pass the information on to someone else — as output. For example, someone might read a book (linguistic input) and then write or tell someone all about it (linguistic output).

When information is transferred, however, its representational form does not always stay the same. In the example just given, the person who read the book (linguistic input) might have chosen to represent his conceptualization of the book by drawing a picture (iconic output). Or, information presented in a table (schematic input) might be used as source material from which a narrative is written (linguistic output), which would represent essentially the same meaning as the table. In these cases, the meaning of the information remains the same, but the form in which it is displayed changes. A transformation has occurred.

It is the transformation from one representational form to another that is at the instructional heart of Strand II. The Strand II material provides input representations in two modes of linguistic display — spoken instruction by the teacher and specially prepared passages, presenting job concepts and information. The student is then required to transform the linguistic display into an iconic display (such as a picture representing some portion of the written passage) or a schematic display (such as a flow chart or classification table). Having made this representational transformation, the student is then required to transform the new display back into linguistic form again when he orally describes his work to his teacher and peers. Figure 7 shows how this transformation process works.

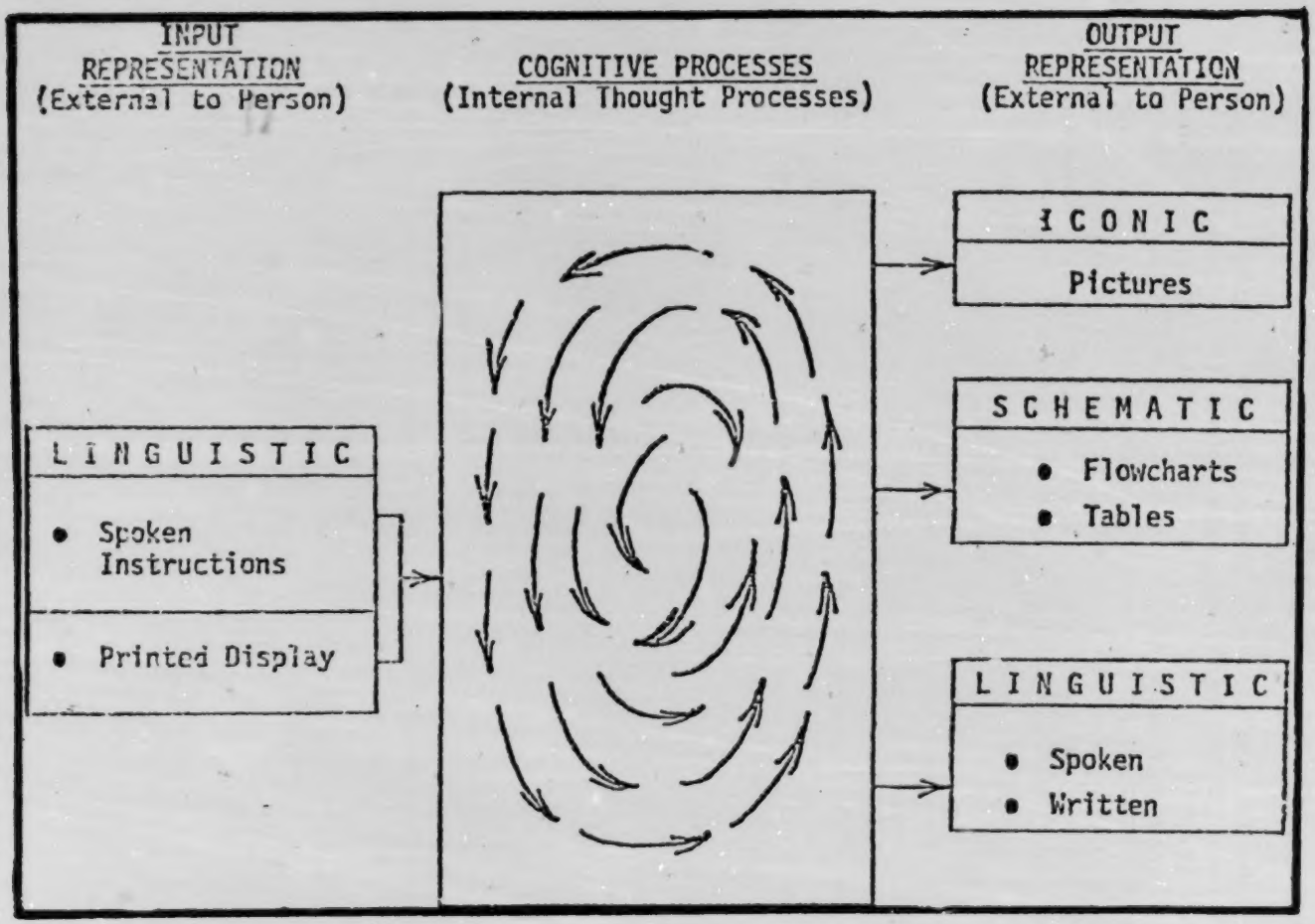


Figure 7. Representation Transformation (RETRAN) Reading Training Procedure

Development of Strand II Job Reading Passages

In order for the students to practice the conceptualizing and reading skills of Strand II, there was a need for a body of materials which the students could use in making representational transformations. Following the FLIT approach, this need led to the development of narrative passages that were designed to (1) challenge and develop the reading skills of candidate students, but not be as difficult as actual technical publications; (2) present important job concepts; and (3) lend themselves to the instructional approach of making transformations.

Selection of Strand II Content

The requirement for the passage to present job concepts led to the problem of identifying which concepts should be presented and used in the JORP. The need for technical information to be presented at a more general and less difficult level than that of actual technical publications led to the consideration of Career Development Courses (CDCs).

Basically, CDCs are home study correspondence type material that present job knowledges on which the airman must demonstrate competence before progressing within a career ladder. An analysis showed that CDCs were a good resource base from which to develop Strand II materials. Furthermore, Mockovak (1974) had identified the major reading problem of Air Force personnel enrolled in base reading improvement programs as the inability to read and understand CDCs. Therefore, a methodology was developed for selecting content areas from these materials. This procedure is presented below and is graphically summarized in Figure 8. A detailed description and survey of the way "successful" versus "unsuccessful" students dealt with the CDC volumes is presented in Appendix A.

Step 1 Determine tasks and knowledge requirements for each AFSC in the job cluster from the specialty training standard (STS).

Step 2 Determine reference materials for the task and knowledge requirements stated in the STSs. (AFM 50-23 states that for each AFSC in the job cluster, the CDCs are the source for the job knowledge components of the Dual Channel OJT Program, and are the sole reference for the specialty knowledge test (SKT) questions. Since the STS is also the controlling document for the SKT, and the CDC is the reference for the SKT, the CDC provides a convenient and economical source of materials from which to develop the JORP materials.)

Step 3 Obtain CDCs and STSs for all AFSCs in a career cluster.

Step 4 Determine those CDC objectives that were tested in the course final examination and textual references for the objectives. This step reduces the volume of directly relevant material presented in the CDC that needs to be considered for inclusion in the training program.

Step 5 Determine major content areas from textual references obtained in Step 4 across AFSCs in the JORP cluster. Compare content areas within STS to ensure focussing on major job knowledges.

Step 6 Match each CDC objective within the cluster to the content areas specified in Step 5.

Step 7 Specify the references (text, chapter review exercises, volume review exercises, course examination questions, and figures) for each CDC objective identified in Step 6 for each AFSC in the JORP cluster. Steps 5, 6, and 7 further reduce the CDC source materials. The product was the Cluster Reference Matrix. The matrixes for each JORP cluster are shown in Appendix B.

Step 8 Develop objectives for each content area across the AFSCs within the JORP cluster.

Step 9 Write JORP reading passages using cluster reference matrix and objectives of Step 8 for each content area.

This procedure yielded a cluster of general content areas across all the AFSCs in the job clusters. The content areas selected in this manner formed the basic resource material for developing and writing each passage.

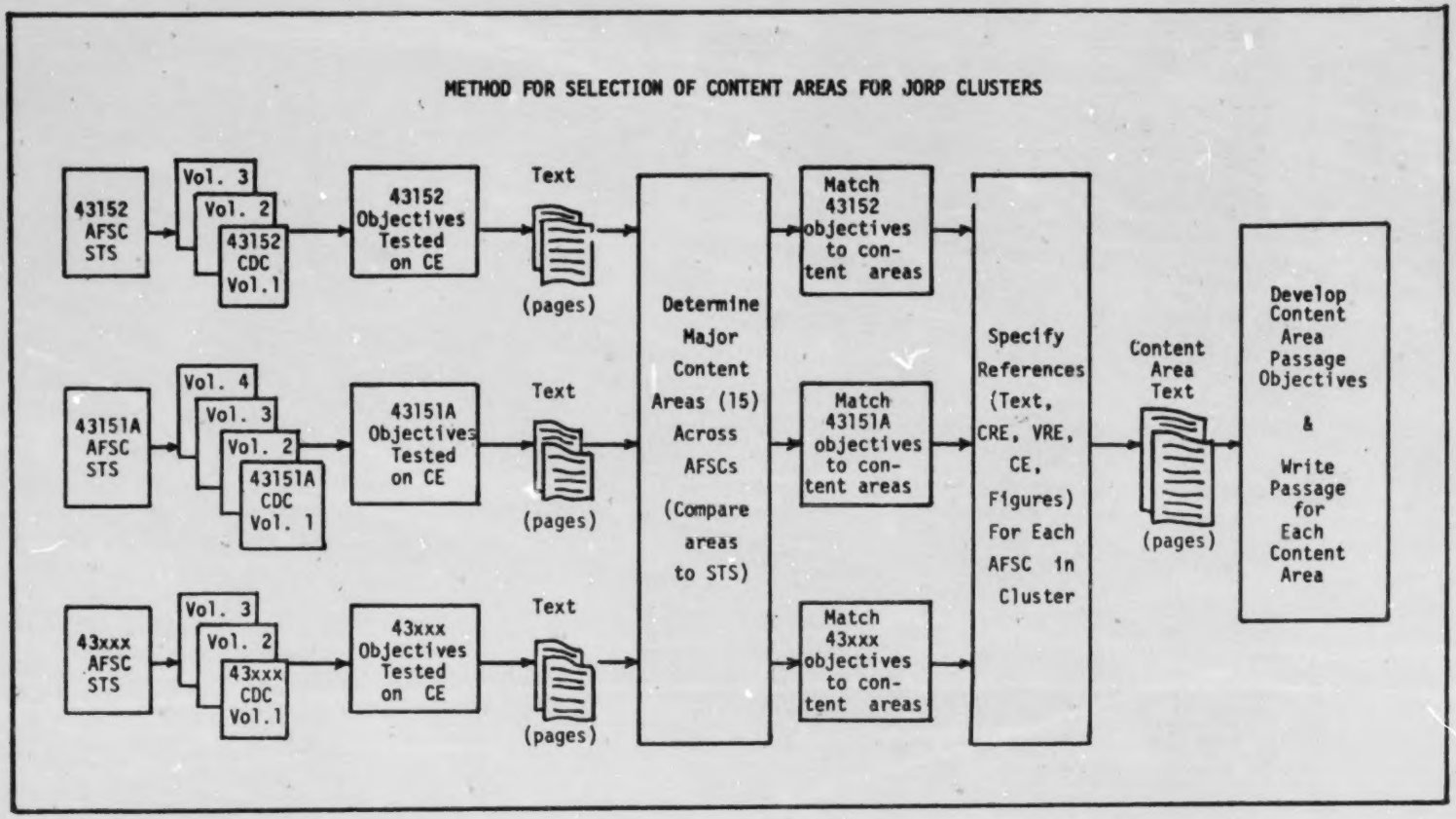


Figure 8. Example of the Method for Selection of Content Areas for JORP Clusters

Writing Guidelines

Once the content areas and their references had been identified, knowledge objectives for each were specified. The knowledge objectives specified the job knowledges that should be achieved by the students after reading and comprehending the narrative description for a given area.

There were 14 narrative passages prepared to represent the 14 job content areas identified for each cluster. Each passage is approximately 1,000 words in length and the reading grade level was targeted at the 9.0 to 10.0 RGL. These passages were also written so that they would be appropriate for making representational transformations from printed displays. The passage title, a short description of the content, its estimated RGL, and the total number of words for each passage in the two JORP clusters are shown in Appendix C.

It is important here to note the distinction between the teaching of job knowledges and the teaching of reading. Even though each passage has knowledge objectives and presents job concepts, it is not the purpose of JORP training to teach job knowledges that are needed to perform effectively on the job. This is the mission and responsibility of Air Training Command and the Air Force On-The-Job Training System. But, reading training cannot be completely divorced from a content area, since some content must be presented with which to conduct reading and literacy training. Thus, the JORP Strand II materiels use *job-relevant content* to reinforce the development of reading skills.

Strand II Conceptualizing Activities

A workbook containing explanatory and practice material was developed to introduce the students to the concept of transformations. The students read about the conceptual activity they would be doing, then practiced the activity by completing a series of exercises. Following this, the teacher guided the group discussion and peer group interaction. The goal of this "Tools for Learning" workbook was to make the student thoroughly familiar with the idea of representational transformation and to provide practice in transforming printed displays into three representation forms: pictures, classification tables, and flow charts.

Once the students completed all the exercises in the "Tools for Learning" workbook, they then practiced these skills on the Strand II narrative passage for their JORP cluster.

Strand II job concepts were presented to the students in the form of job-reading passages to which they applied various conceptualizing strategies or schemes useful in the process of "comprehending" the concepts contained in the passage. A conceptualizing task in the JORP was defined as any activity in which the student was asked to transform job knowledge information from one representational form (input) to another (output). The training materials focus on transforming printed linguistic displays into other forms of representation — iconic and schematic.

Iconic Representation — In this type of conceptualizing activity, the student was required to represent concepts by drawing pictures of them. However, it was stressed that this activity did not require "artistic ability"; the important point was to illustrate with any level of artistry, the concepts presented in the job-reading passage. The drawings were to be labeled. Figure 9 shows different student iconic transformations from the same narrative passage describing Aircraft Main Landing Gear.

Schematic Representation — Classification Tables — In this type of conceptualizing activity, the student was required to construct a classification table from the information presented in the narrative. The students were to construct their own superordinate categories and sort the concepts in the narrative passage into the correct cells of their table. Figure 10 shows different student classification tables for the same narrative passage description.

Schematic Representation — Flow Charts — In this type of conceptualizing activity, the student was required to transform the printed display into a schematic display called a flow chart. Students were taught the use of standard symbols in the "Tools for Learning" workbook, and used these to show sequential activities and decision points identified in the procedural narrative descriptions. Figure 11 shows different student flow charts for the same narrative description about updating Aircraft Maintenance Directives.

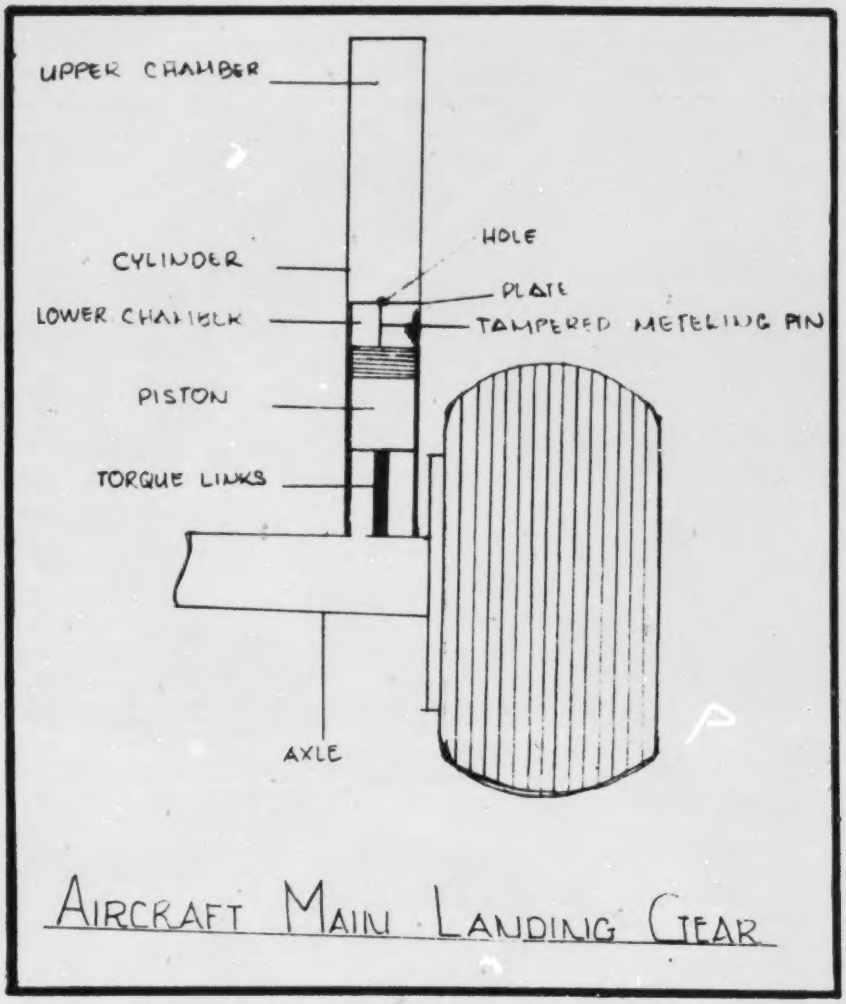


Figure 9. Student Examples of Iconic Presentations from the Same Narrative Passage.

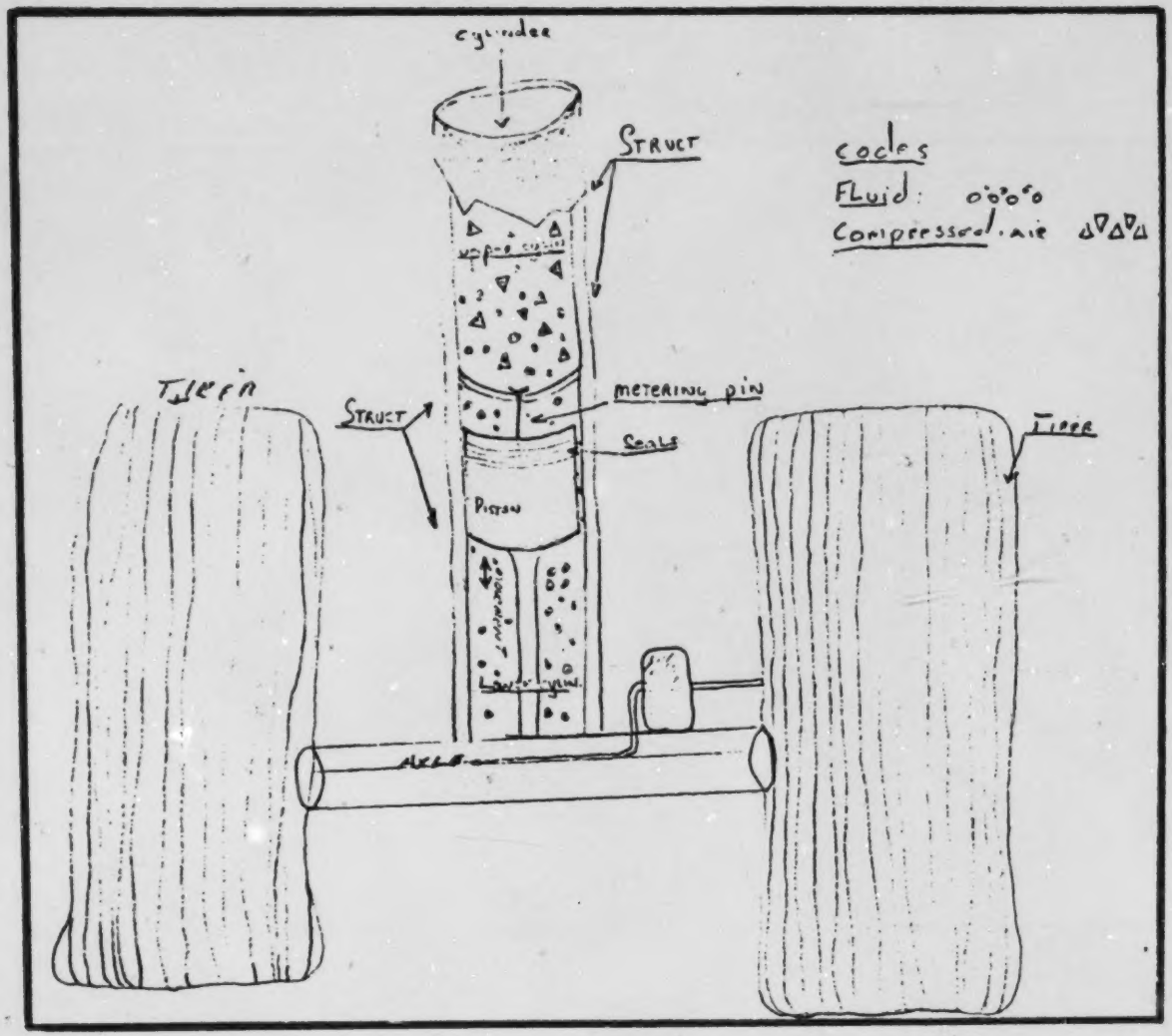


Figure 9. Student Examples of Iconic Presentations from the Same Narrative Passage (cont)

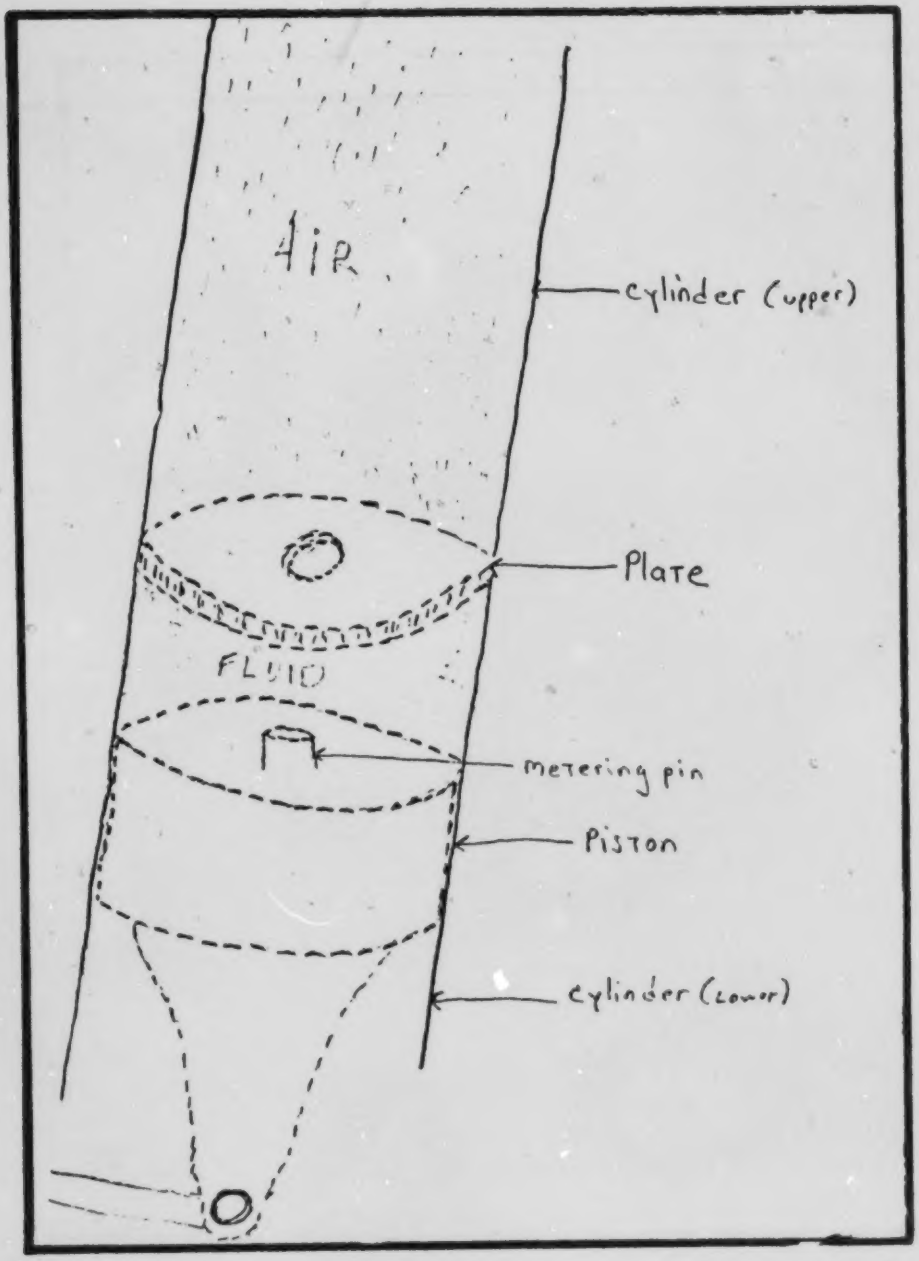
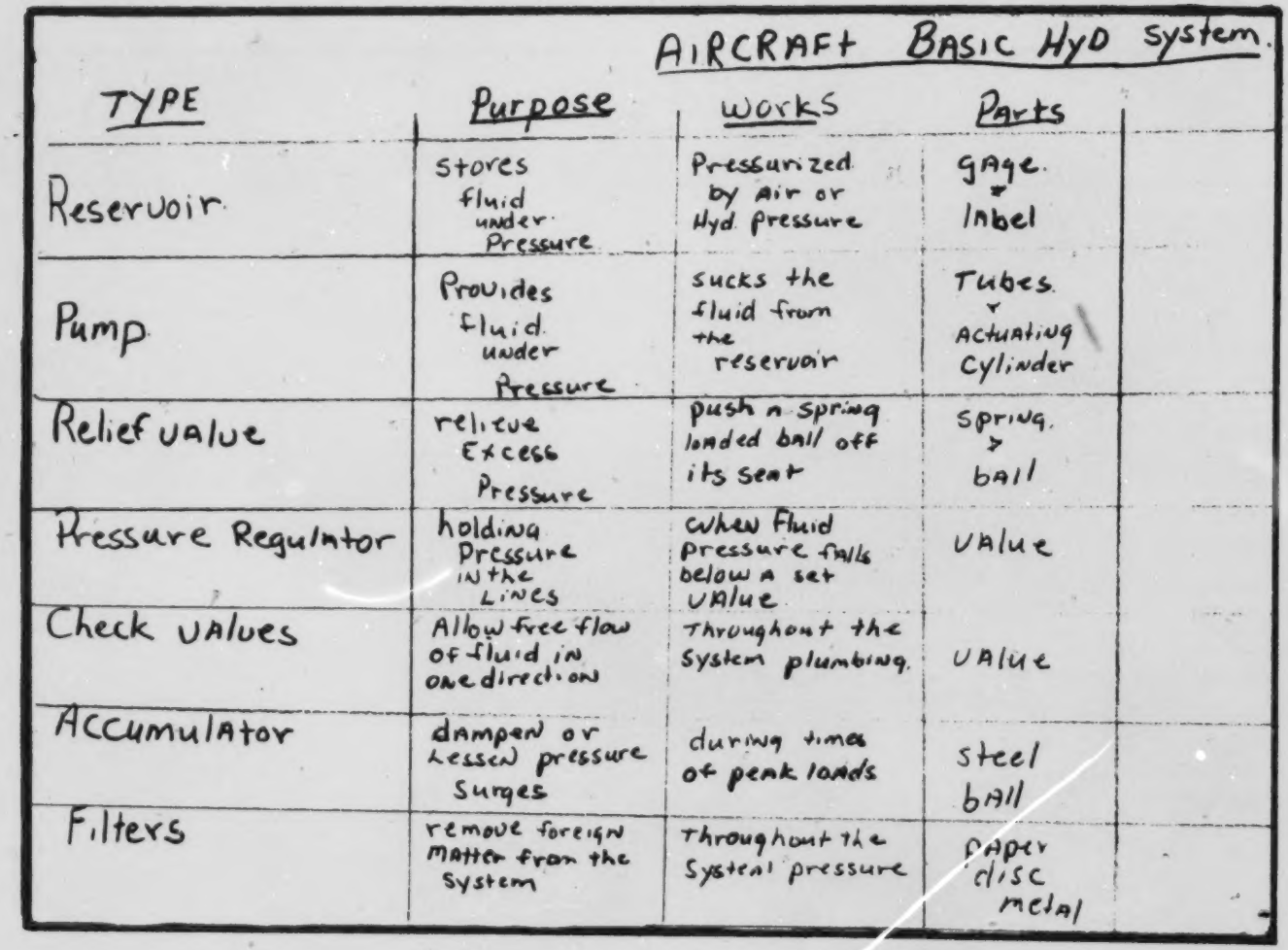


Figure 9. Student Examples of Iconic Presentations from the Same Narrative Passage (continued)



AIRCRAFT BASIC HYD system.

TYPE	Purpose	works	Parts	
Reservoir	stores fluid under Pressure	Pressurized by Air or Hyd pressure	gage. ▼ label	
Pump	Provides fluid under Pressure	sucks the fluid from the reservoir	Tubes. ▼ Actuating Cylinder	
Relief value	relieve Excess Pressure	push a spring loaded ball off its seat	spring. ▼ ball	
Pressure Regulator	holding Pressure in the Lines	when Fluid pressure falls below a set value	value	
Check values	Allow free flow of fluid in one direction	throughout the system plumbing.	value	
Accumulator	dampen or lessen pressure surges	during times of peak loads	steel ball	
Filters	remove foreign matter from the system	throughout the Systeal pressure	paper disc metal	

Figure 10. Student Examples of Classification Tables from the Same Narrative Passage

HYD. PARTS	PURPOSE	POWER OF OPERATION	MAJOR FUNCTION
Reservoir	Stores Fld. under Pressure to ensure enough Fld. is always there for the pump	HYD Press.	Gauge to check Fld. Level
Pump	Provide Fld. under Press. to the Sys.	Engine driven or manually	Tube transmit output force to move the piston in the actuating cylined to oper. equip.
Relief Valve	Relieves excessive press. due to increased temp. in the sys.	spring loaded operated	Allows Fld. to go through the valve + return to reservoir to stop the tube from being broken.
Pressure Regulator	Holds press. in the lines	N/A	Makes the sys. more efficient, safe, + durable.
Check Valve	Free flow of Fld. in ONE direction / no flow in the other.	N/A	An emerg. back-up source for hyd. press. Should there be a pump failure.
Accumulator	Dampen or lessen press. surges / AND the pump duration & peak loads	Hydraulically	↓
Filters	Remove Foreign matter from the sys.	N/A	

Figure 10. Student Examples of Classification Tables from the Same Narrative Passage (continued)

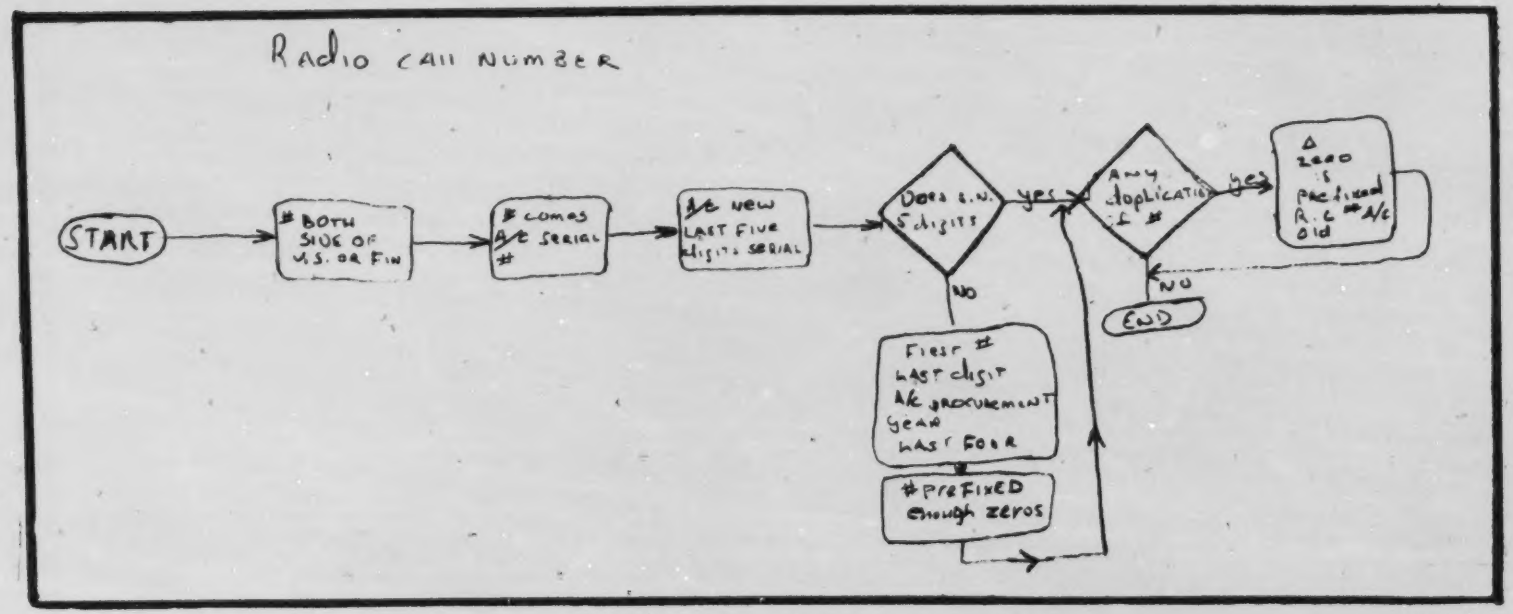


Figure 11. Student Examples of Flow Charts from the Same Narrative Passage.

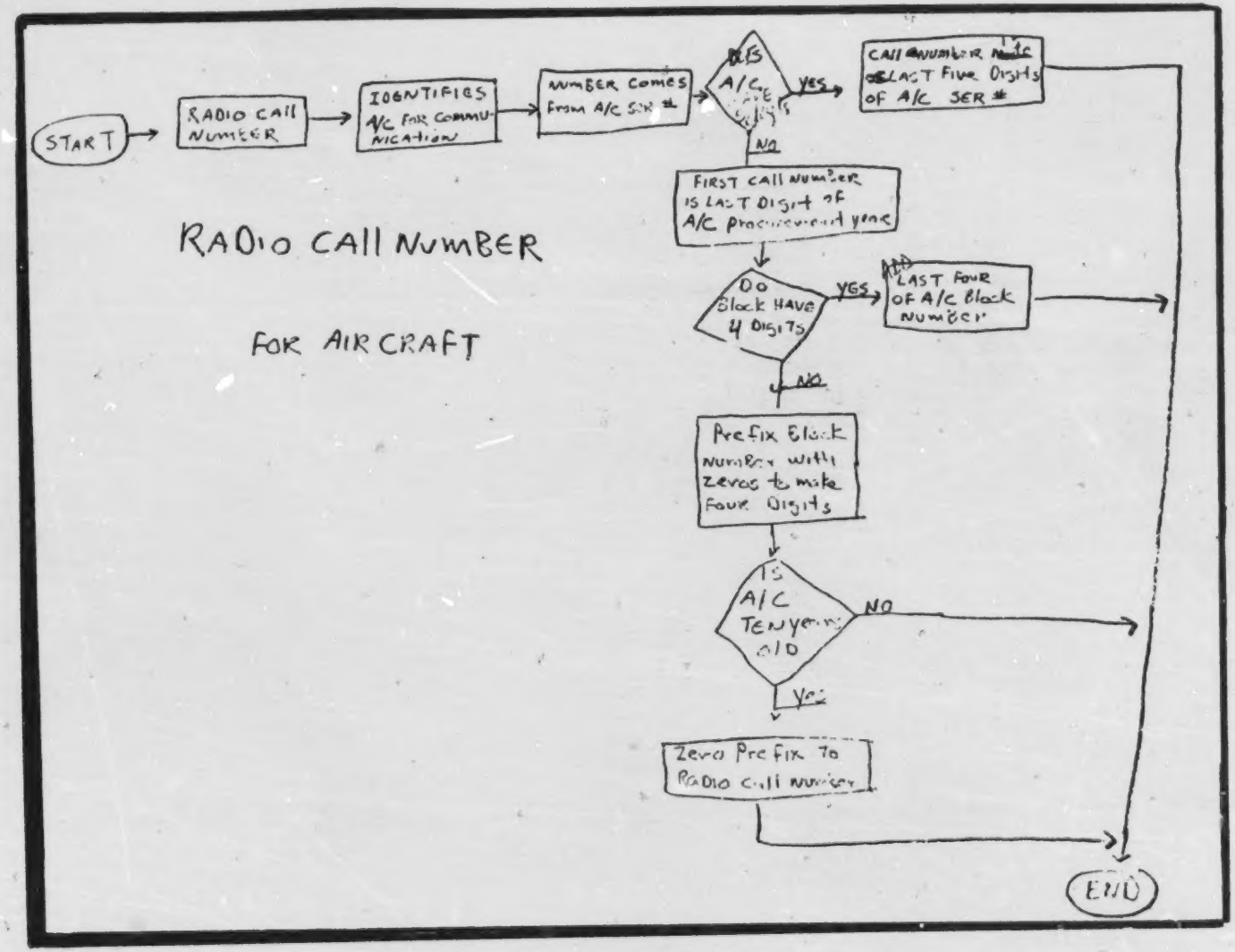


Figure 11. Student Examples of Flow Charts from the Same Narrative Passage (cont.)

Strand II Instructional Approach

The design and nature of the Strand II activities demanded active participation and interaction by the teacher with the students. The training/learning activities were designed to be directed and controlled by the teacher. There was less reliance on the materials to "carry the instruction" than in the Strand I modules. Of primary importance in the Strand II activities was the fact that students were not just given worksheets to "fill out and turn in." Rather, after learning the basics of making transformations, the students were given a passage and then guided by the teacher to "transform" their own internal conceptualization of the written passage into a different representational mode. The teacher's role was to provide assistance as the students made the desired transformations.

It is important to note that the transformations made by the students were neither right nor wrong in the sense that there was only one "correct" answer as in Strand I. The transformations made by the students were judged by the individual student, his peers, and the instructor in terms of its appropriateness to the transformation task instructions and the content presented in the passage. This judgement was arrived at through group and individual interactions with the teacher about the representations produced by the students. The teacher's role was that of a catalyst, to stimulate the students to examine their transformation products. It was through this type of interaction and feedback that the students learned to increase their conceptualizing and information-processing skills.

Chapter 3
JORP FIELD TEST

The prototype program described in Chapter 2 was field-tested at Travis Air Force Base, California, during the period 16 August 1976 to 12 November 1976. Travis AFB was chosen as the field test site because it met the following criteria:

- An already functioning reading program with adequate funding and appropriate student-teacher ratio (approx. 12:1).
- A large enough population in the relevant AFSCs to insure sufficient sample size.
- Appropriate classroom facilities for an individualized, self-paced program.
- Sufficient major command interest (Military Airlift Command) to insure support through the duration of the field test.
- Reasonable proximity to HumRRO/Western Division offices on the Presidio of Monterey, CA.

The existing reading program at Travis Air Force Base was being conducted primarily with VA funds through the veterans Pre-Release Education Program (PREP), which was administered by the local high school district, the Travis Unified School District. The classroom designated for JORP consisted of a portion of a larger room, containing 15 individual carrels.

SELECTION OF STUDENTS

Actual selection of the airmen who were to participate in the JORP was done through the base education office using criteria identical to those already in use at Travis AFB, and directed by AFM 50-23, to wit: trainees who have a score of 60 or below on the "general" aptitude section of the ASVAB or AQE are scheduled for USAFI Achievement Test (UAT) III, Reading section, parts 1 and 2; airmen with a reading grade level less than 9 on either part 1 or part 2 are enrolled in the base reading improvement program. These criteria were to be used to identify 96 airmen as subjects for the field test; however, as a result of the accidental use of inappropriate criteria, only 61 persons who met the original requirements were available to participate in the JORP. However, 32 airmen, who were above the 9th RGL and erroneously selected, were kept in the classes for a total sample of 93.

JORP ASSESSMENT INSTRUMENTS

Two types of assessment instruments were developed for use in evaluating the JORP prototype.

1. Strand I in-training module mastery tests (proficiency tests).

2. Overall Strand I & II performance tests (Job-Oriented Reading Program Test).

Strand I Module Proficiency Tests

In order to permit quality control monitoring of student performance during the Strand I training, proficiency tests were developed for each of the modules of instruction. These were used to assure that the student had developed mastery of that reading task before proceeding to the next module. The test had no time limit per se; however, to satisfactorily master the task, the student must have met the dual criteria of accuracy and time — not more than two wrong answers in 20 minutes or less.

The prototype proficiency test (or pro-test, as they were generally referred to) is made up of two sections, each with its own text materials and set of ten questions. The text which the student read in order to answer the questions was a sample of job reading materials taken directly from an AF publication, and the questions were similar in type and content to those encountered in the worksheets. A separate answer sheet was provided. The student's task was to read the questions on the right side of the test booklet, look up the answers in the pages of text provided on the left side of the test booklet, and write the answer on the separate answer sheet. After answering the ten questions in one section, the student turned to the next section of the test booklet and continued working. Since the student might have to take more than one test within a module before demonstrating mastery, three different forms of the test were developed for each module. The attempt was made to make these forms equivalent.

The one exception to the above was in the Forms module. The Forms module did not have an overall pro-test, per se. Instead, each form had its own set of three alternate tests which were composed of one section each. The instructions for completing the form were on the left side of the test booklet and the information to be filled

in on the blank form was on the right side of the booklet. There were approximately 20 entries required to be filled in on the form, but the accuracy and time criteria remained the same. Otherwise, the proficiency tests were standard across the various modules except for the job-related content.

Job-Oriented Reading Program Test

The function of the JORP Test was to provide an overall measure of the ability to perform the basic types of reading tasks encountered in learning and doing various Air Force jobs. In contrast to the module-specific assessment function of the Strand I module protests, the JORP Test served to evaluate the effectiveness of the entire program in teaching what it was designed to teach.

The test required students to read actual job reading materials to obtain the kinds of information job incumbents seek from job and training manuals. In addition, the JORP Test measures information processing skills by requiring the student to transform linguistic input (print) into schematic output (flow chart and classification table). It is a group test, which requires one hour for administration and consists of four parts. Parts I and II measure skills at performing typical job reading tasks in the Air Force; i.e., Strand I skills. Parts III and IV measure skills at making representational transformations; i.e., Strand II skills. All responses are of the short answer or fill-in type, which substantially eliminates the problem of chance success. There were three alternate forms of the test: A, B, and D. The JORP Test was developed to meet the following design criteria:

1. Test content samples directly from the domain of reading skills taught in the JORP.

2. No requirement for specific job knowledge.

3. Use of free, constructed responses, rather than a fixed-alternative, multiple-choice answer format.

4. A correct answer dependent totally upon using the information contained in the test passages and not on guessing or prior knowledge of the content.

The test also served to provide a summative evaluation instrument on the instructional effectiveness of the training material and procedures of the JORP.

CONDUCT OF THE INSTRUCTIONAL PROGRAM

Schedule

The instructional day at the Travis JORP was divided into four 2½ hour sessions, beginning at 0800. This arrangement allowed four classes per day to be held in the same facility at the Travis PREP center. Students were dismissed about ten minutes before the end of each period, to allow the teacher to prepare for the next class.

The class periods of two hours and 20 minutes were divided between Strand I and Strand II activities. Although the relative amount of time devoted to each varied (on some days the whole session would be spent on one strand), more time was usually spent on Strand I than Strand II. Each of the two JORP teachers taught two classes per day, and each class ran for six weeks.

In-Processing

On the first day of class, the students were first given a short orientation to the purpose of the reading program in the Air Force and the activities they would pursue in the JORP. Then, an overall program pretest (JORP Test) was administered, using forms A and B alternately. Following the JORP Test, students filled out two background information questionnaires — one for the JORP and one for the Travis Unified School District. As students turned in their completed questionnaires, they were administered their first pretest in Strand I.

On the second day of class, the students were administered a general reading test. After the first two classes were administered the UAT III, it was discovered that many of the students had taken the UAT III several times before enrollment in the JORP training. As a result, the reading comprehension section of the Test of Adult Basic Education (TABE) (CTB/McGraw Hill, 1976) was used to get an estimate of the general reading comprehension on the remaining six classes. The TABE Level D was administered using forms 3 and 4 alternately. After the administration of this test, the student resumed Strand I activities begun the day before.

Strand I

After the JORP Test and questionnaires were administered the first day, the student was assigned to the Maintenance or Non-Maintenance career cluster on the basis of his or her AFSC. The student then entered one of the four modules in the cluster (chosen at random by the teacher). As Figure 12 shows, the student progressed through the four modules of Strand I as a result of satisfying the Proficiency Test (pro-test) passing criteria.

Upon entering their first module, the students were administered a pro-test as a pretest. If they satisfied the dual criteria (completion within 20 minutes and a score of no more than two wrong), they advanced to another module. If they failed the pretest, they were given a set of worksheets to complete. In the Forms module, each worksheet set first guided the student step-by-step through the instructions for preparing a particular form, then provided practice in making the correct entries. In the other modules, there were two sets of worksheets. Each set provided practice in the job-reading skill of that module.

In all cases, the criterion for successful completion of a set of worksheets was to answer every question correctly. When a student had filled in one worksheet, he handed it to a peer scorer, and then proceeded to the next worksheet in the set. The scorer indicated which answers were incorrect and handed the worksheet back to the student, who then corrected the errors. At this point, the student could use the assistance of the teacher or a peer. The worksheet was returned to the student as many times as necessary to achieve the 100% criterion.

When the student had achieved 100% criterion on every worksheet in a set, an alternate form of the Proficiency Test was administered. If they passed this test, they advanced to another module. If they failed it, they repeated the training cycle, using the same set of worksheets (in the Forms module), or a new, second set (in the other three modules) and then were given a third form of the Proficiency Test.

Ideally, in the case of those who failed the pro-test for the third time (i.e., after two sets of worksheets), tutoring by the teacher or a peer would be followed by recycling through the module until the pro-test was passed. However, in actual practice a shortage of time obliged the teacher to advance the student to another module. This latter course was necessary to insure that every student received training in every module of Strand I within the six-week period of the field test.

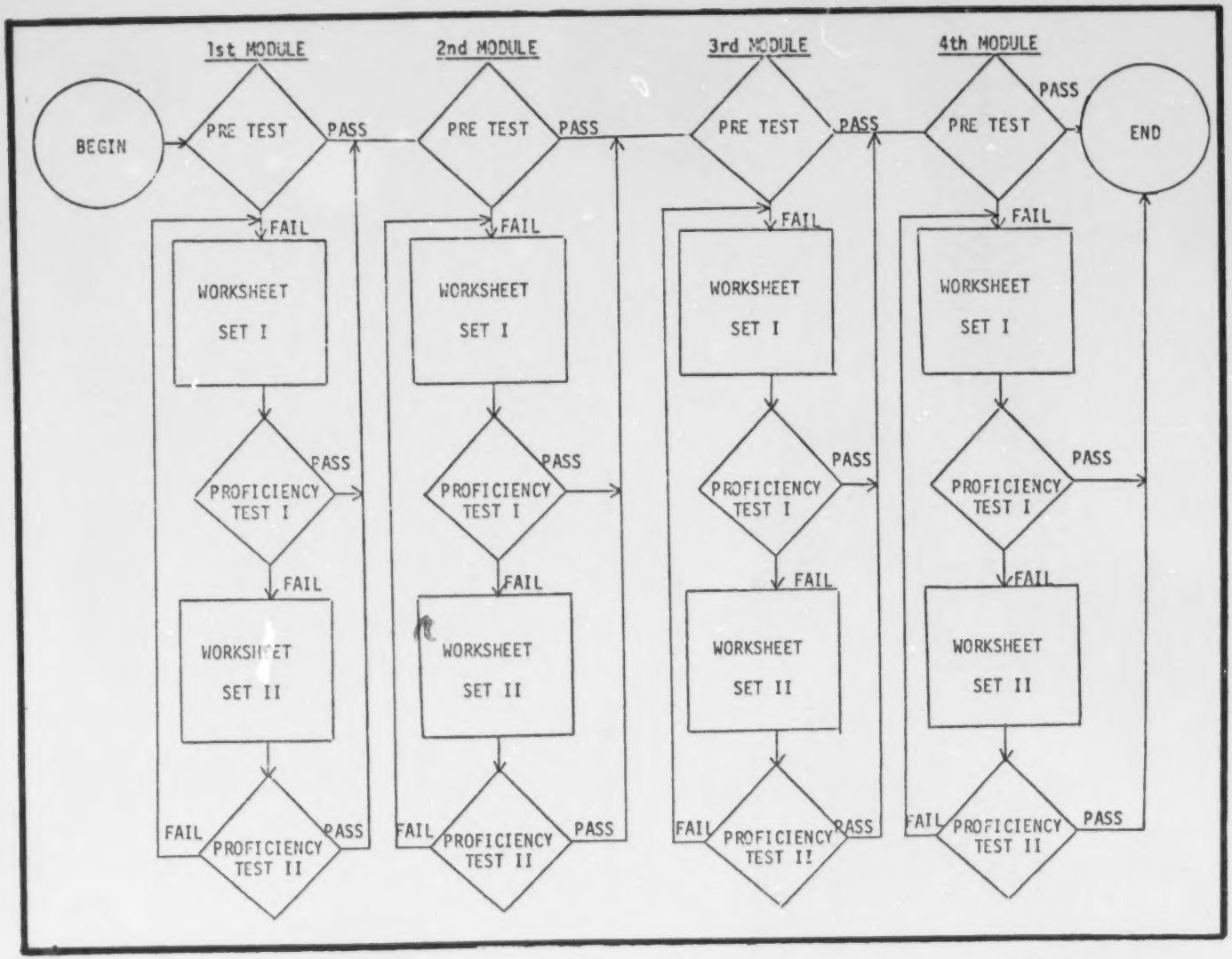


Figure 12. Flow Chart of Student Progression Through the Four JORP Modules

Strand II

For the first two to three weeks of each six-week class, 45 to 90 minutes per day were used to complete the Strand II workbook, "Tools for Learning". Group sessions were conducted by the teacher, during which the three conceptualizing activities were practiced and discussed. Students often worked in small groups to make the representational transformations required by the worksheets in the workbook. To discuss a student's work, the class was shown the worksheet or it was reproduced on the chalkboard.

During the final three to four weeks of the class, the job-reading passages were used each day to practice a particular mode of transformation. In this way, about 14 passages could be discussed during the course. A typical group session lasted one hour, beginnig with the oral reading of the passage for the day, and ending with the discussion of the representational transformations produced during the session. Ordinarily, Strand II was practiced after Strand I, but this order was sometimes reversed for variety.

Out-Processing

On the next to last day of class, each student took the JORP Test form (A or B) not previously taken. After the JORP Test, the general reading test was administered, again using the alternate form for each student.

On the last day of class, a Student Post Job-Oriented Reading Program Survey was given to each student to complete. After this questionnaire was returned, the students were administered an AFHRL-developed alternate form JORP test (Form D) parallel to those developed by the contractor (HumRRO). Finally, each student was given a certificate of course completion during a short interview with the teacher. At this interview, the student's progress in the JORP, as measured by his pre-to-post JORP Test gain, was discussed.

Chapter 4
EVALUATION OF THE JORP PROTOTYPE

In this chapter we will present data on the characteristics of the JORP students and on the effectiveness of the prototype reading training program as it was developed and operated at Travis AFB, CA. Summative data will be presented primarily in terms of gains and end-of-course achievement levels on both the measure of general reading comprehension and the JORP Test measure of proficiency in performing a variety of job-reading tasks.

CHARACTERISTICS OF THE JORP STUDENT

The appropriateness and operating effectiveness of any training program is in large part a function of the students who are engaged in the program. This section describes some characteristics of the 93 students who were trained at Travis AFB, CA during the field evaluation.

All of the students were assigned to Travis AFB on a permanent party basis and were performing in various job assignments. Detailed descriptive data were obtained from a background questionnaire administered on the first day of class.

The ages and educational levels of the students are shown in Table 3. The median age was 22, and median years of education completed was 12. Ninety-five percent of the students reported having a high school diploma, with the rest having a GED equivalency, which contrasts with their mean entry RGL of 9.24 on measures of general reading comprehension, as shown in Table 4.

The reading comprehension section of the UAT III and TABE were used to measure the general reading comprehension of the JORP students. Two classes (N = 23) were pre- and post-tested using UAT III, while (for reasons stated in Chapter 3, In-Processing, page 57) the rest of the classes (n = 70) were pre- and post-tested using the TABE.

Since the difference between the entry RGL means on the UAT III and TABE was not significant, they were combined. Thus, in the remainder of this report, whenever measurement of general reading comprehension is discussed and/or compared, it will be based on the combined student RGLs.

TABLE 3. AGES & EDUCATION LEVELS OF JORP STUDENTS

Age	N	%	Years of school completed	N	%
18	3	3.2			
19	11	11.8	10	1	1.1
20	8	8.6	11	2	2.2
21	14	15.1	12	75	80.6
22	12	12.9	13	9	9.6
23	11	11.8	14	2	2.2
24	10	10.8	15	1	1.1
25	7	7.5	16	3	3.2
26	6	6.4			
27	3	3.2			
28	1	1.1			
29	2	2.2			
> 29	5	5.4			
TOTAL	93		TOTAL	93	
MEAN	23		MEAN	12.26	
MEDIAN	22		MEDIAN	12	

High School Diploma	88	94.6
GED Certificate	5	5.4
Neither	0	0
TOTAL	93	100.0

TABLE 4. ENTRY READING GRADE LEVEL (RGL) OF JORP STUDENTS

	UAT	III	TABE		COMBINED		CUMULATIVE
RGL	N	%	N	%	N	%	%
< - 4.9	0	0.0	1	1.4	1	1.1	1.1
5.0- 5.9	0	0.0	3	4.3	3	3.2	4.3
6.0- 6.9	2	8.7	5	7.1	7	7.5	11.8
7.0- 7.9	5	21.7	6	8.6	11	11.8	23.6
8.0- 8.9	7	30.5	16	22.9	23	24.7	48.3
9.0- 9.9	3	13.1	11	15.7	14	15.1	63.4
10.0-10.9	1	4.3	11	15.7	12	12.9	76.3
11.0-11.9	5	21.7	9	12.9	14	15.1	91.4
12.0-12.9			5	7.1	5	5.4	96.8
> 12.9			3	4.3	3	3.2	100.0
TOTAL	23	100.0	70	100.0	93	100.0	
Mean RGL	8.83		9.38		9.24		

As noted in Chapter 3, 61 students were identified as reading below the 9.0 RGL on the basis of UAT III scores. However, the results of the second day in-processing testing on the general reading test, showed that only 45 of the 93 students scored below the 9.0 RGL. This result reflects the difficulties encountered in identifying appropriate students for a developmental reading course of this type.

There were only eight female students in the sample of 93. The distribution of enlisted grades of the students is shown in Table 5.

TABLE 5. ENLISTED GRADE OF JORP STUDENTS

GRADE	N	%
E-1	1	1.1
E-2	26	27.9
E-3	26	27.9
E-4	29	31.2
E-5	11	11.9
TOTAL	93	100.0

There was some variety in the ethnic group representation in the JORP sample, as shown in Table 6. Only 12% of the sample were foreign born. Of these, 73% were from the Philippine Islands and their mean time in the United States was 32.25 months.

TABLE 6. ETHNIC GROUPS OF JORP STUDENTS

ETHNIC GROUP	N	%
Black American	43	46.2
Anglo American	34	36.5
Filipino	8	8.6
Spanish-American	3	3.2
Pacific Island	2	2.2
American Indian	2	2.2
Puerto Rican	1	1.1
TOTAL	93	100.0

The language background of the JORP students is shown in Table 7. For the most part, English was the primary language of the students, and only 9% had potential English As A Second Language (ESL) difficulties.

TABLE 7. LANGUAGE BACKGROUND OF JORP STUDENTS

LANGUAGE	Students' Primary Language		Language Spoken in Home	
	N	%	N	%
English	85	91	79	85
Filipino	5	6	7	8
Spanish	1	1	3	3
Samoan	1	1	1	1
Navaho	1	1	1	1
German	0	0	1	1
Guamanian	0	0	1	1
TOTAL	93	100	93	100

Whatever the literacy difficulties of the JORP students, they were not likely due to ESL problems, but, more likely, to inadequate reading skills in their own primary language.

The distribution of Air Force specialties (AFSs) in terms of the training cluster for the JORP sample is shown in Table 8.* There were 23 different AFSs represented in the sample. The Aircraft Maintenance Specialist (431) career specialty made up roughly one-third of the sample.

*It is interesting to note that the 10 career fields that Mockovak (1974) cited as accounting for 83.9% of the individuals enrolled in a reading program at the time of his survey were the same career fields that accounted for 81.8% of the students enrolled in the JORP Field Tryout at Travis AFB.

TABLE 8. DISTRIBUTION OF AIR FORCE SPECIALTIES (AFS) BY MAINTENANCE & NON-MAINTENANCE TRAINING CLUSTERS (N = 93)

MAINTENANCE				NON-MAINTENANCE			
AFS	N	% of Maint.	% of Total	AFS	N	% of N-Maint.	% of Total
Aircraft Systems Maintenance				Mechanical/ Electrical			
421	3	5.9	3.2	542	3	7.1	3.2
423	3	5.9	3.2	Structural/ Pavements			
424	1	2.0	1.1	552	1	2.4	1.1
426	1	2.0	1.1	551	2	4.8	2.1
Aircraft Maintenance				Sanitation			
431	33	64.6	35.6	566	1	2.4	1.1
432	2	3.9	2.1	Fire Protection			
Vehicle Maintenance				571	1	2.4	1.1
472	3	5.9	3.2	Transportation			
Metal Working				600	1	2.4	1.1
531	2	3.9	2.1	602	1	2.4	1.1
Fuel Services				603	3	7.1	3.2
631	2	3.9	2.1	605	7	16.6	7.5
Aircrew Protection				Food Services			
922	1	2.0	1.1	622	1	2.4	1.1
				Supply			
				645	4	9.5	4.4
				647	2	4.8	2.1
				Administration			
				702	6	14.2	6.5
				Printing			
				711	1	2.4	1.1
				Personnel			
				732	2	4.8	2.1
				Security Police			
				811	2	4.8	2.1
				Medical			
				902	3	7.1	3.2
				903	1	2.4	1.1
TOTALS							
10	51	100	54.8	18	42	100	45.2

Eighty percent of the students were technical school graduates. Those students who were enrolled in a CDC concurrently with enrollment in the JORP training made up 47% of the sample. Self-reported performance with CDC materials for all students is shown in Table 9. Most (83%) of these students reported that they were able to complete their CDC requirements without any difficulties.

TABLE 9. CDC PERFORMANCE OF JORP STUDENTS

	Failed a vol. review exercise		Failed end-of-course examination	
	N	%	N	%
Yes	10	11	16	17
No	83	89	77	83
TOTAL	93	100	93	100

The students were asked whether or not they did any job reading and if that type of reading presented any problems to them. Table 10 summarizes the responses. It is interesting to note that the 22 percent of Air Force personnel reporting difficulties with job printed materials is consistent with the percent of Navy job incumbents (25%) reporting "some" difficulty understanding job printed materials in another study (Sticht, Fox, Hauke, & Zapf, 1976).

TABLE 10. PERCENT OF JORP STUDENTS REPORTING JOB READING TASKS & JOB READING PROBLEMS

	% performing any job reading tasks		% reporting job reading difficulties	
	N	%	N	%
Yes	80	86	21	22
No	13	14	72	78
TOTAL	93	100	93	100

Fourteen percent of the students reported they did not do any job reading. This result was confirmed when the students were asked to specify the average number of hours spent reading on the job per day. Table 11 shows these data. Nineteen percent of the students reported that they spent no time doing any job reading. This is somewhat surprising, considering the emphasis placed upon job printed

TABLE 11. REPORTED DAILY JOB READING TIME OF JORP STUDENTS AND AFSs OF THOSE REPORTING NO JOB READING

Hours	N	%	AFSs of Students Reporting No Time Spent Doing Job Reading	N
0. -0.	18	19.4	431	3
			542	1
0.1 -0.9	15	16.1	551	1
			566	1
1.0 -1.9	25	26.9	603	2
			605	3
2.0 -2.9	13	14.0	631	1
			645	2
3.0 -3.9	8	8.6	711	1
			811	1
4.0 -4.9	4	4.3	902	1
			922	1
5.0	10	10.7		
TOTAL	93	100.0	12	18
Median	1.5			

matter in the Air Force. The median daily job reading time for the JORP students was 1.5 hours, which is comparable to the median daily job reading time of 1.8 hours reported by Navy job incumbents (Sticht et al., 1976). When queried about their desire to take the course, 59% said they wanted to take the JORP training, while 36% said they did not; 5% were undecided.

STRAND I MODULE EVALUATION DATA

In this section, data appropriate to the evaluation of the individual modules of Strand I are presented. The purpose of Strand I is to provide training in the performance of specific reading tasks involved in learning about how to do a job and in the day-by-day performance of that job. This objective was given full operational meaning in the sets of proficiency tests constructed for each module. The evaluation of the Strand I program consisted, then, of determining the effectiveness of each module in training students to reach the mastery criteria of the criteria-referenced proficiency tests for that module.

Training Effectiveness of Modules

The four instructional modules of Strand I were Schematics, Narrative, Procedural Directions, and Forms. For the first three of these, there were module proficiency tests prepared in three alternate forms, which were used to assess module-specific proficiency before and after instruction. The Forms module does not have an overall module pre- and post-test for proficiency; rather, each of the four forms used for training is its own "sub-module" with three alternate versions for each form. Table 12 shows for each module and form:

1. The percentage of students who successfully passed the pretest for the module or form and advanced immediately to the next module.

2. The percentage who failed the pretest and then passed the post test after instruction.

3. The percentage of students who failed the pretest and subsequently failed the post test or never did complete the module.

Data from both the maintenance and non-maintenance clusters have been combined in this table.

TABLE 12. STRAND I MODULE PERFORMANCE

ALL JORP STUDENTS

(1) Module	(2) N	(3) Passed Pretest %	(4) Passed Post-test %	(5) Failed or Did Not Complete %	(6) Training Effectiveness* %
Schematic	92	12	28	60	32
Narrative	91	10	21	69	23
Procedural Directions	92	17	32	51	39
Forms					
AFTO 781A	85	12	74	14	84
AFTO 781H	78	0	88	12	88
AF 601b	82	5	82	13	86
AF 1996	67	0	93	7	93

It is clear from Table 12 that most of the students needed training in all of the modules. For example, while 17% of the students were able to reach criterion level on the Procedural Directions pretest (and thus, did not need training in this task area), none of the students were able to reach the criterion level in filling out AF Form 1996 prior to instruction.

Regarding the Failed or Did Not Complete column (5), it should be recalled that some students did not achieve proficiency in a given module after recycling, and they were moved into the next module to make sure they had some exposure to all the different job-reading tasks before the six weeks of training were completed. While this practice precluded strict adherence to mastery performance criteria, the modules are not necessarily hierarchical and so cumulative deficits in skills would not be expected to result.

* (4) ÷ (4 + 5)

The effectiveness of each training module is shown in column 6. These data were obtained by dividing the entry in column 4 by the sum of the entries in columns 4 and 5. The training effectiveness percentage is thus the percentage of those students who could not pass the module proficiency test before instruction, but who did pass the pro-test in that module or form after instruction.

The overall effectiveness of the Forms module was approximately three times that of the other three instructional modules. The reason for this dramatic difference lies in the nature of the task being trained. In the Schematic, Narrative, and Procedural Directions modules, the students practiced the generalized task of extracting information embedded in various informational displays (i.e., table, graphs, narrative descriptions, flow charts, etc.). The students were pre- and post-tested on the reading tasks in these modules using informational displays similar to those practiced during instruction. However, with each form, the students practiced filling out only that particular form, rather than practicing the generalized task of filling out forms; they were pre- and post-tested on the same form used during instruction, although different information with which to fill in the blanks was provided. Simply put, the job-reading tasks required of the students to meet criterion levels on form-specific training in the JORP were different from those required in the other modules.

The training effectiveness of the Schematic, Narrative, and Procedural Directions modules in training students to the specified level of proficiency was 32, 23, and 39 percent, respectively. These relatively low values suggest that, for about two-thirds of the JORP students, the approximately 42 hours of instruction in the Strand I type tasks may have been insufficient time in which to accomplish the required learning. In this regard, Sticht (1975) reports approximately twice the training effectiveness for the FLIT training program which devoted approximately twice the training time to Strand I type tasks than did JORP. Of course, a variable that may have had some impact here is low motivation of those JORP students who expressed resentment at being required to participate in the field test.

In spite of these considerations, it does appear that the JORP students did acquire job-related reading skills.

Speed & Accuracy Criteria

Satisfactory performance on the module proficiency tests is specified in terms of the dual criteria of accuracy and time: 90% of the 20 constructed response/fill-in questions must be answered correctly within 20 minutes for students to pass a module proficiency test. Table 13 shows the percentage of students failing module pretests for reason of insufficient accuracy, taking too much time, or for reasons of both time and accuracy. For example, of the students who failed the Schematics pretest and entered instruction in that module, 56% failed to meet the accuracy criterion, 7% failed to meet the time criterion, and the remaining 37% failed to meet both criteria. On the average, failure to attain the 90% level of correct answers accounts for 38% of the student failures on the module pretests and 46% of the students failed to meet either the accuracy or the time criterion.

For those same students, Table 14 shows their mean pretest scores on the criterion measure they failed. This table shows that students failing the Schematics module pretest on accuracy only, answered 69.2% of the questions correctly on the pretest. Those failing to meet the time criterion took an average of 25.7 minutes to complete the pretest, and those with sub-standard scores on both accuracy and time, answered 61.6 of the questions correctly and took 29.7 minutes to finish the test. Data are shown only for the variables on which performance was sub-standard: students whose less-than-90% correct scores are shown in the accuracy column, did complete the test in not more than 20 minutes; those whose failing time scores are shown in the time column did get at least 90% of the test items correct; and those whose average scores on both criterion dimensions are shown, failed on both accuracy and time.

In summary, the data in Table 12 indicate that most students failed to pass the module pretests; in Table 13, we see that 38% of the students failing the module pretests failed to meet the 90% criterion level of accuracy, and another 46% failed on both accuracy and time; and those students who failed the module pretests averaged 67% correct on those pretests. Thus, it seems reasonable to conclude that, while many JORP students enter with some ability to perform these job-reading tasks, they do show a need for additional training on the fundamental skills trained in the JORP.

TABLE 13. PERCENTAGE OF STUDENTS FAILING A MODULE PRETEST FOR REASONS OF ACCURACY, TIME, & BOTH ACCURACY & TIME.

	% OF STUDENTS FAILING PRETEST CRITERIA		
Module	Accuracy %	Time %	Accuracy & Time %
Schematics	56	7	37
Narrative	18	28	54
Procedural Directions	42	12	46
Mean	38	16	46

Mean N = 80

TABLE 14. MEAN PRETEST SCORES OF STUDENTS FAILING MODULE PRETESTS

Module	Reason for Pretest Failure			
	Accuracy % correct	Time minutes	Accuracy & % correct	Time minutes
Schematics	69.2	25.7	61.6	29.7
Narrative	68.0	31.4	69.3	31.3
Procedural Directions	62.6	27.2	63.0	27.9
Mean	66.71	29.74	65.16	29.77

N = 80

SUMMATIVE EVALUATION OF THE JORP

This section of the report deals with the overall effect of the two separate instructional strands. Overall effectiveness is based on the pre- and post-test administration of alternate forms of the JORP Test discussed earlier and the general reading comprehension tests (UAT III and TABE). The results of these tests are shown in Table 15. The pre-to-post gain on the JORP Test is significant beyond the .001 level. There was approximately a 50% increase in the test score after instruction. However, for the general reading measure, the value was not significant, and the .4 gain in RGL could be accounted for by chance fluctuation in the sampling or by testing artifacts. Because the JORP Test had not been scaled with a general reading test at the time of this field test, RGLs are not reported for the number of points obtained by the students. Because of this consideration, AFHRL has undertaken a norming study of the JORP Tests. For purposes of the present study, it was possible to get an estimate of what a certain number of points on the JORP Test means in terms of RGL by computing a least squares regression of RGL on JORP Test scores using the preliminary norming data.

The resulting correlation between general reading grade level and JORP Test scores was .52.

TABLE 15. READING PERFORMANCE OF JORP STUDENTS

TYPE OF MEASURE	N	ENTRY	EXIT	GAIN	VALUE	P
JORP Test	93	33.40*	49.53*	16.13*	7.90	<.001
General Reading UAT III & TABE	93	9.24**	9.65**	.41**	1.47	NS

*Number of points obtained out of 80 possible.

**Reading Grade Level

But using this correlation, a pretest value of 33.40 on the JORP Test converts to a 10.15 RGL and the post test value of 49.53 on the JORP Test converts to a 11.32 RGL. Thus, the estimated gain from pre to post on the JORP Test in terms of RGLs was 1.17, or nearly three times the gain made in general reading scores. This is the same gain ratio that Sticht (1975) reports for the FLIT students. For the sake of clarity, and since the general reading measures did not show significant gains for the JORP students, the sub-group comparisons reported in the remainder of this chapter are based only on the pre-to-post gains on the JORP Test.

JORP Test Part Score Gains

The JORP Test is composed of four parts, with parts 1 and 2 measuring the overall effects of Strand I, and parts 3 and 4 measuring the overall effects of Strand II. Table 16 shows the pre-to-post scores for each part separately and for Strand I and Strand II components. There were significant pre-to-post gains on every part of the JORP Test. However, there were significantly more gains made on the Strand II part than the Strand I part; in fact, twice as much gain. This difference could be accounted for in terms of motivation to learn Strand II skills, since students reported on their post JORP training surveys that Strand II activities were preferred and more useful to them than Strand I activities. (See Appendix D, Student Post JORP Survey, Questions #10 and #12, for greater detail. The results of the students' post training survey of attitudes will be discussed as they relate to comparisons made on the JORP Test between various groups. Appendix D shows the complete student survey data.) This pre-to-post gain on the JORP Test holds for nearly all the following comparisons between sub-groups and supports the position that the instruction received by the students was effective and relevant to those job-reading skills measured by the JORP Test.

TABLE 16. OVERALL JORP TEST RAW SCORE CORRECT; PRE AND POST INSTRUCTION

	JORP TEST PART 1	2	3	4	STRAND I	STRAND II	T	P
Mean Pretest	8.14	9.09	9.66	6.57	17.23	16.23	.802	NS
Mean Posttest	10.99	11.57	15.57	11.01	22.56	26.58	3.124	<.01
Gain	2.85	2.48	5.91	4.44	5.33	10.36		
T	3.709	3.051	7.950	5.089	4.111	8.362		
P	<.001	<.01	<.001	<.001	<.001	<.001		
N = 93								

Sub-Group Comparisons of JORP Test Effectiveness

In this section, we present data on various sub-group comparisons and the effectiveness of the instruction on these groups. Because of the initial difficulties in identifying students below the 9.0 RGL for entry in the training program, there were a large number of students reading at or above that level. Table 17 shows the comparison of these two groups in terms of JORP Test scores. The students were divided into the above- and below-9.0 RGL groups on the basis of their performance on the general reading comprehension measure administered the first day of class. Table 17 shows that students above the 9.0 RGL had a significantly higher pretest score on the JORP Test. This may be due to their higher general reading skills and abilities. While there were also significant posttest differences between the RGL groups, these were probably due to the differences in the initial reading skills and abilities between the two groups. Both groups did show significant improvement in JORP Test performance.

TABLE 17. PRE AND POST JORP TEST SCORES FOR STUDENTS ABOVE & BELOW 9.0 RGL

	<9.0			≥9.0				
	N	Mean	SD	N	Mean	SD	T	P
Pretest	45	27.58	12.08	48	38.87	12.14	4.50	.001
Posttest	45	45.44	13.75	48	53.33	14.25	2.71	.01
	T 6.55			T 5.35				
	P < .001			P < .001				

Since the current project was focused on the development of two prototype training clusters, the Air Force was concerned with how effective these two training curricula were in meeting the needs for job reading training across different AFSs. Because a variety of students with different AFSs formed the JORP sample, it was possible to look at the differences in performance between the groups for whom the training curricula content had been designed, and all other students in the program for whom the content was not specifically designed. Therefore, all students coming from the 64, 70, 42, and 43 career fields were compared to all other students in the sample. Table 18 presents these data.

TABLE 18. PRE & POST JORP TEST SCORES OF STUDENTS FOR WHOM TRAINING MATERIALS WERE DESIGNED VERSUS ALL OTHER STUDENTS

	64, 70, 42, 43* (Designed For)			ALL OTHERS (Not Designed For)				
	N	Mean	SD	N	Mean	SD	T	P
Pretest	55	34.18	13.62	38	32.28	12.96	.68	NS
Posttest	55	52.07	12.97	38	45.08	15.57	2.28	.05
	T 7.05			T 3.89				
	P < .001			P < .001				

*See Table 8 for designation of AFS codes.

From Table 18, it can be seen that both groups made significant gains on their pre-to-post scores, indicating that the instruction was effective for both groups. However, the Designed For group (students coming from the 64, 70, 42, and 43 career fields) achieved significantly greater post scores than did the Not Designed For group. This suggests that, for the training curricula to be maximally effective in training job-reading skills, the curriculum content should be appropriate to the job which the airman is performing. The exact reasons for this finding are unclear. One possible explanation involves the further practice on the job of reading skills and the integration of knowledges taught in the reading training school. Another possibility is that the students for whom the materials were designed were more motivated because the materials were more appropriate to them. However, the important point remains, that the job-reading training curriculum needs to be designed for the AFSs that comprise the training cluster in order to achieve maximum effectiveness in a job-reading training program.

This finding was also supported by many critical comments (both anecdotal and as reported in the follow-up surveys) concerning the inappropriateness of the curriculum for those JORP students for whom the training curriculum was not designed. However, it is interesting to note, again, that the job-reading skill performance of this group *did significantly improve* as a result of training when pre-to-post scores are compared within this group.

Table 19 presents the data from a comparison of <u>all</u> Maintenance students and <u>all</u> Non-Maintenance students on the JORP Test. (See Table 8 for AFS designations of Maintenance and Non-Maintenance groups.)

TABLE 19. PRE-TO-POST JORP TEST SCORE FOR ALL MAINTENANCE & ALL NON-MAINTENANCE STUDENTS

	MAINTENANCE			NON-MAINTENANCE				
	N	Mean	SD	N	Mean	SD	T	P
Pretest	51	32.90	13.08	42	34.38	13.63	.531	NS
Post Test	51	50.14	14.05	42	48.79	15.16	.442	NS
	T	6.41		T	4.58			
	P	< .001		P	< .001			

Again, the pre-to-post gains within both groups were significant, but there was no significant difference between the groups on pre or post scores. Thus, the training appears to have been equally effective for both the Maintenance and Non-Maintenance groups.

Comparisons were made within each training cluster between the students whose AFS was specific to the content sources from which the training materials were drawn and all other students who took that particular training cluster. These data are shown in Tables 20 and 21.

TABLE 20. COMPARISON OF PRE-TO-POST JORP TEST SCORES OF MAINTENANCE STUDENTS FROM THE 42 & 43 CAREER FIELDS TO ALL OTHER MAINTENANCE PERSONNEL*

	MAINTENANCE (42,43)			MAINTENANCE (All Others)				
	N	Mean	SD	N	Mean	SD	T	P
Pretest	43	33.97	13.26	8	25.88	10.60	1.90	NS
Post Test	43	52.09	13.08	8	37.63	13.57	2.78	.01
	T	6.38		T	1.93			
	P	.001		P	NS			

*See Table 8 for designation of AFS codes.

TABLE 21. COMPARISON OF PRE-TO-POST JORP TEST SCORES OF NON-MAINTENANCE STUDENTS FROM CAREER FIELDS 64 & 70 TO ALL OTHER NON-MAINTENANCE PERSONNEL*

	NON-MAINT. (64, 70)			NON-MAINT. (All Others)				
	N	Mean	SD	N	Mean	SD	T	P
Pretest	12	34.92	15.43	30	34.00	13.15	.182	NS
Post Test	12	50.67	13.34	30	48.03	15.97	.547	NS
	T	2.675		T	3.71			
	P	.02		P	.001			

*See Table 8 for designation of AFS codes.

As shown in Table 20, the only group for whom the training did not produce a significant increase from pre-to-post training was in the group of Maintenance personnel who were not from the 42 or 43 career fields. This lack of significance was probably due to the size of the group (N = 8) since the direction of change was in the anticipated direction. The differential effect of the training shown in Table 20 for the Maintenance group from the 42 and 43 career fields is supportive of the differential effects of the training shown in Table 18, since the curriculum materials for the Maintenance cluster came exclusively from the content of 42 and 43 career fields.

A comparison of Technical School graduates and Non-Technical School student scores is presented in Table 22.

TABLE 22. PRE-TO-POST JORP TEST SCORES FOR TECHNICAL SCHOOL GRADUATES & DIRECTED DUTY ASSIGNEES

	TECH. SCHOOL GRADUATES			DIRECTED DUTY ASSIGNEES				
	N	Mean	SD	N	Mean	SD	T	P
Pretest	74	34.07	13.83	19	30.84	11.06	0.941	NS
Post Test	74	50.73	14.75	19	44.84	12.72	1.593	NS
	T	7.089		T	3.621			
	P	< .001		P	< .001			

Again the pre-to-post gains after instruction were significant within both groups. However, there were no significant differences between the groups in terms of JORP scores.

In summary, the data indicate that the JORP training resulted in increased proficiency at job-reading skills for all groups of students. The relatively low initial scores of both high and low ability readers suggests that general reading level may not be a good indicator of job-reading ability. However, the more proficient readers tend to achieve better scores after training on the job-reading tasks than do the less apt students. This finding is consistent with evidence from educational research in which the more able, higher ability students normally get more out of their training experience than do the low ability students.

There was evidence presented that suggests the content of the training curriculum is an important and potent variable, influencing the effectiveness of the training system. Careful consideration should be given to the manner in which future job-reading training curriculum clusters are generated and developed for the Air Force.

Detailed attitudinal data on the effectiveness of the JORP training for both students and their supervisors are presented in Appendixes D and E respectively.

Concluding Comments

During the course of this project, several issues surfaced which seemed appropriate to address as part of this report.

An important consideration in the implementation of any program of the type involved here is the appropriateness of various delivery systems, and the likelihood of each being successful. During the field test, several problems that arose were specifically related to the lockstep nature of the instructional program. Initial scheduling problems were encountered, and there was considerable inconvenience to those whose shifts changed during the course of training, causing them to work more than the normal 8 hour day, sometimes in non-contiguous time periods. In an operational setting, a self-paced learning center approach may be a more desirable delivery system. While this was not possible within the constraints of the field test, the current set of materials should be compatible with such an approach. Strand I is essentially self-paced, and the instructor could handle all the test scoring that during the field test was shared with the students. While Strand II was specifically intended to capitalize on the benefits of peer interaction, the effectiveness of the materials would probably not diminish substantially if used within a learning center environment. Students could study the "Tools for Learning" workbook and then apply the techniques to the specially constructed passages. If there happened to be more than one student in the center working on Strand II, they could compare and criticize each other's work in much the same manner as was originally intended. If such interaction was not possible, a set of flow charts, pictures, and classification tables which had previously been produced by others could be used for comparison by the individual student. While this approach would require somewhat more tedious attendance to the task and is not the most desirable, one could expect that considerable benefit would be derived. No new materials would have to be developed for a learning center approach; one would merely have to collect several sets of Strand II student products to be used for a student's self-evaluation.

Even though those students whose AFSC's were not specific to the available JORP clusters generally demonstrated significant improvements in post-test JORP scores, it still seems reasonable to suggest that job-related content is an important aspect of the curriculum materials. This is true both conceptually and practically. One component of reading ability is familiarity with job concepts and vocabulary. To the extent to which the students can acquire improved

knowledges in these two areas, they should become more capable on the job. Also, to the extent that most of the content of the materials is familiar or consistent with their current knowledge, their attention can be directed specifically to the reading tasks being trained. Anecdotal information as well as responses to questions on the post-JORP student surveys suggest that one of the primary criticisms of the course by some students was that it was not related directly to their specific job. Thus, it seems reasonable to state that the following two criteria are, at the least, desirable in the future implementation of the JORP concept: (1) reading tasks taught in the program should be relevant to job task demands, and (2) the content of the materials within which these skills are trained and practiced should facilitate maximum transfer to the job and, thus, be specific to the AFSCs of those enrolled in the reading program.

With respect to this latter point, it is unrealistic and unnecessary to go to the extreme of requiring immediate implementation of one package of JORP materials for each career field. This is certainly not necessary in cases of closely related fields, such as the 42 and 43 career fields in this study. However, a close look at the reading task demands of the many AF career areas would be required to make precise estimates of the number of clusters that are needed. In considering this issue, a suggested approach would be to develop materials for only those segments of the Air Force population in which reading problems appear to be most severe. As noted earlier (page 14), ten career fields appear to contribute somewhat more than eighty percent of the student enrollment in base level reading improvement programs. It is our suggestion that these career fields be addressed first if the full operational implementation of JORP is to be pursued. Specifically, it is recommended that: (1) the present nonmaintenance cluster be split into a 70/73 administrative cluster and a 64 supply cluster, and (2) three additional clusters be developed to cover the 54/55 civil engineering, 81 security police, and 60 transportation areas. This would provide a total of six clusters for full JORP implementation. These JORP clusters - maintenance, administration, supply, civil engineering, security police, and transporation - would address most of the problem readers in the Air Force. The currently available maintenance and nonmaintenance JORP clusters could be used until these more specific additional clusters are developed.

The final and perhaps most significant consideration in reviewing the JORP is that of validity. The selection of tasks to be included in the program was not based on the results of a systematic reading task analysis. Rather, it was partially based on the general knowledge by

the investigators of reading tasks encountered on the job and partially on the identification of reading tasks from the CDC materials. Both of these approaches are open to some criticism, the former because of its subjectivity and the latter because thorough reading of the CDCs is not necessary to pass the CDC End of Course Examination. Thus there is mainly speculation that the skills taught, particularly in Strand II would be useful in the performance of actual reading tasks required by the job. While these shortcomings of the JORP do exist, they are currently being addressed and it is anticipated that future reports will document the findings of this follow-on research. In spite of these limitations it still seems appropriate to recognize the face validity of the curriculum materials and to recommend that the Air Force continue to move toward a functional literacy, job-oriented reading approach, as opposed to the general literacy training that has traditionally been used.

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APPENDIX A

CAREER DEVELOPMENT COURSES (CDC)

DESCRIPTION OF CDC

In the Air Force, the upgrade training (UGT) has been highly structured to ensure that airmen have both the job skills proficiencies and job knowledges to perform satisfactorily on the job. This dual track — one of skill proficiencies and the other of job knowledges — is incorporated into the on-the-job training (OJT) system.

CDCs are self-study correspondence materials administered by the Extension Course Institute (ECI) at Gunter AFB, Alabama. For nearly every AFSC in the Air Force, there is a set of CDC materials that has to be completed as the airman advances in skill within an AFS. The Dual Channel OJT program requires that airmen training to the next higher skill level through formal UGT use the CDC self-study courses geared to their AFS.

Typically, a CDC is made up of three or four volumes. Each volume contains a series of chapters composed of specific objectives, followed by narrative text and then a series of questions, Chapter Review Exercises (CRE), to guide the student's study. At the completion of each volume, the student completes a Volume Review Exercise (VRE) which is an open-book multiple-choice exercise on the information in the volume.

When the VRE answer sheet is completed, it is forwarded to ECI for grading and the student proceeds to the next volume. VRE scores are returned to the student indicating which objectives in the volume need further study. Upon satisfactory completion of all the VREs, the student is then scheduled to take the Course Examination (CE) at the Base Testing Office. This examination is closed-book, and serves to determine whether or not a trainee has satisfactorily completed the CDC. After completing both the job skill proficiency checkouts and the CDC course exams, the airman is then considered for upgrade action to the next highe skill level within his AFS. (See AFM 50-23 for a more complete discussion of CDCs.)

SURVEY OF STUDY SKILLS WITH CDCs

Mockovak (1974) reported in his survey of reading programs in the Air Force that, of the 5,774 airmen enrolled at the time of the survey, 55% were cited as having difficulty reading, comprehending, and passing CDC material. Since the successful completion of CDCs is prerequisite to advancement in the Air Force, it seemed useful to attempt to determine if there were certain study skills, learning strategies, etc., that distinguished trainees who were "successful" and "unsuccessful" on their CDCs. It was thought that this might reveal skills that might be trained in the JORP. This appendix presents the findings of that survey.

CDC Survey Sites and Student Characteristics

Travis and McClelland AFBs were chosen as sites to conduct the CDC survey because of their proximity to the contractor and the availability of a sufficient sample of airmen in the 431 and 702 career fields. A successful student was defined as any trainee who had passed any CE for any CDC on the first attempt. An unsuccessful student was defined as any trainee who had failed any CE for any CDC on the first attempt. A total of 37 students were identified for the sample. Table A-1 shows a summary of the student characteristics.

There were basically no differences between the successful and unsuccessful students on any of the characteristics shown in Table A-1, with the exception that the unsuccessful students had more time in the career field and more rank.

TABLE A-1. DESCRIPTIVE CHARACTERISTICS OF CDC SURVEY INTERVIEWEES

Student Characteristics		Successful		Unsuccessful		TOTAL	
		N	%	N	%	N	%
Source of 3-skill Training	Tech.School	13	35.1	14	37.9	27	73.0
	DDA	5	13.5	5	13.5	10	27.0
Career Field Assigned	702 Admin	9	.3	9	24.3	18	48.6
	431 A/C Main.	9	24.3	10	27.1	19	51.4
Grade	E-2	1	2.7	1	2.7	2	5.4
	E-3	16	43.2	15	40.6	31	83.8
	E-4	1	2.7	2	5.4	3	8.1
	E-5	-	-	1	2.7	1	2.7
Education Level (Highest grade completed.)	11	-	-	4	10.8	4	10.8
	12	14	37.9	12	32.4	26	70.3
	13	3	8.1	2	5.4	5	13.5
	14	-	-	1	2.7	1	2.7
	15	1	2.7	-	-	1	2.7
Time in career Field	4 Mos-1 Yr	15	40.5	10	27.1	25	67.6
	1-2 yrs	2	5.4	5	13.5	7	18.9
	2-4 yrs	1	2.7	3	8.1	4	10.8
	Over 4 yrs	-	-	1	2.7	1	2.7

Findings of CDC Survey

Each student was interviewed using a structured interview form. The interview took approximately 45 minutes to complete. Table A-2 shows the amount of time the students spent studying their CDCs. Few of the students — either successful or unsuccessful — had a regular study schedule. When they did study, both groups studied about the same amount of time.

TABLE A-2. STUDY TIME DEVOTED TO COMPLETED CDC MATERIALS

		Successful	Unsuccessful
Regular Study Schedule	Yes	3	3
	No	15	14
Number of Days Studied During Week	Range	1-5	1-5
	Avg	3.2	3.0
Number of Hours spent in each study session	Range	1/2-6	1/2-5
	Avg	2.2	2.5

Table A-3 shows the kinds of techniques reportedly being used. Also, Table A-3 shows comparison data for a group of Navy students with similar characteristics and time in service. Both Air Force groups are remarkably similar in the techniques they employ. Also, the frequencies of use of the techniques by the Navy and Air Force personnel are similar. The correlation between the assigned ranks of the Air Force and Navy personnel based on the frequency of use of the study techniques shown in Table A-3 is .61. Underlining was the most frequent study technique used, with outlining and drawing as the least frequent methods used by both the Air Force and Navy personnel. Thus, those techniques that require more internal thought processing by the student were least preferred.

TABLE A-3. STUDY TECHNIQUES EMPLOYED BY AIR FORCE & NAVY STUDENTS

Q. When you study, do you use any of these study techniques?

	Air Force Frequencies		N = 37 Total Air Force		N = 61* Total Navy	
	Success	Unsuccess	%	Rank	%	Rank
Make Outline	2	1	8	7	40	8
Underline Important Parts	14	15	78	1	81	1
Draw Pictures & Diagrams	1	1	5	8	52	7
Look up words in Dictionary	7	9	43	2.5	67	5
Look over section before study	9	5	16	6	68	4
Ask yourself questions	8	4	37	4	78	2
Take Notes	4	2	32	5	72	3
Try to memorize	8	8	43	2.5	62	6

*from Sticht, Fox, Hauke, and Zapf, 1976 (r = .61)

The students were asked to describe their general CDC study approach by responding to a question designed to identify the sequence of study activities engaged in by the airmen. Table A-4 lists the alternative responses available to the students, rank ordered in terms of decreasing study time likely to be required by the use of that study sequence.

TABLE A-4. CDC GENERAL STUDY SEQUENCE FOLLOWED BY SUCCESSFUL & UNSUCCESSFUL STUDENTS

	Successful	Unsuccessful
1. Preview volume, then read word-for-word, complete CREs & VREs (ECI prescribed approach).	6	6
2. Preview volume, read word-for-word, complete VREs.	2	2
3. Read only parts of volumes necessary to answer CRE & VREs.	2	3
4. Skim read through volume, then read only parts necessary to answer VREs.	1	2
5. Read only parts of volume necessary to answer VREs.	7	2
6. Did not study or did not read.	0	4

Both the successful and unsuccessful group frequencies are nearly identical for the first four study sequences. The last two sequences (5 and 6) show some interesting results. More than three times the number of successful students concentrated only on the parts of the CDC volume necessary to answer the VREs. Also, 21% of the unsuccessfuls did no study or reading of the CDC.

It is interesting to note that sequence 5 is the most effecient method to simply get by the hurdle of completing CDC requirements. It appears that the successful students were able to perceive this fact and adjust their study habits to achieve this goal. This interpretation is further supported by the data in Table A-5, showing the students' estimates of the number of CE questions that come from the VRE questions.

TABLE A-5. PERCEIVED & ACTUAL PERCENTAGE OF CE QUESTIONS COMING FROM THE VRE QUESTIONS

Q. In your estimation, what percentage of the questions on the final course exam (CE) come from the Volume Review Exercise (VRE) questions?

	Successful	Unsuccessful
Percent of students estimating 90% or higher.	61%	32%
Actual percentage of CE questions from VRE questions.	Admin. 100%	A/C Maint. 70-90%

Thus, more successful than unsuccessful students do not read all the information in the CDC volume, but do only the minimum amount of study required to do the VRE exercises and concentrate on them. This study sequence is rewarded by the fact that in both career fields surveyed, the percentages of CE questions that come almost word-for-word from the VREs, is more than sufficient to satisfactorily complete the CDC material, since the passing criterion is 60% for these two career development courses.

The information displayed in Table A-6 suggests that most of the students do not perceive the CDC material as providing much of their job knowledge. The students indicated their main source of job knowledge came from doing the job.

TABLE A-6. SOURCES OF JOB KNOWLEDGE

Q. Where did you get MOST of your job knowledge?*

Source	Successful	Unsuccessful
Technical Training School	2	3
Job Experience	12	15
Supervisor	4	7
Co-Worker	6	6
CDC Materials	--	2
Previous Work Experience	1	1

*Some students reported two or more sources.

Table A-7 shows the students' perceived problems with the CDC materials. The items in the Problems column were presented in the survey for the students to check as they desired. The most significant problem cited by the

TABLE A-7. PROBLEMS WITH CDC MATERIALS

PROBLEMS	Successful	Unsuccessful	Total
Material not related to job	5	4	9
Reading Problems (vocabulary, comprehension, questions)	-	7	7
Materials were boring	5	1	6
Not enough time allowed to complete study	-	1	1
Could not remember information	-	1	1

unsuccessful students was that of reading difficulties. This finding is consistent with Mockovak's (1974) data. The successful students' comments centered about the boring nature of the CDC materials and their lack of relevance to the job assignment.

APPENDIX B

AIR FORCE MAINTENANCE & NON-MAINTENANCE CLUSTER TOPIC CHARTS

These charts show the references to the major content areas selected for the inclusion in the JORP. The following descriptions define the column headings of the charts.

CONTENT AREAS

This column represents the common concepts and topic headings across AFSCs within each cluster from which the passages were developed and reading exercises delineated.

AFSC

This is the Air Force Specialty Code designation for those CDC materials included in each cluster. The exact titles are as follows:

Maintenance:

- 42152 - Aircraft Pneudraulic Repairman
- 43121A - Aircraft Maintenance Specialist, Reciprocating Engine Aircraft
- 43151C - Aircraft Maintenance Specialist, Jet Aircraft, One & Two Engine
- 43151F - Aircraft Maintenance Specialist, Turboprop Aircraft
- 43151E - Aircraft Maintenance Specialist, Jet Aircraft Over Two Engines

Non-Maintenance:

- 64550 - Inventory Management Specialist
- 64750 - Materiel Facilities Specialist
- 70250 - Administration Specialist

OBJECTIVE (NO.)

This column is the Behavioral Objective number or the Lesson or Study number given in the CDC materials.

OBJECTIVE (REF.)

- This column shows the volume and page reference where the objective number can be located.

TEXT DISCUSSION

This column lists the volume, paragraph, and page references for the textual presentation and discussions within each CDC.

CHAPTER REVIEW EXERCISES

This column lists the references for and number of items (questions) in the chapter review exercises associated with the content area within the CDC materials.

VOLUME RFVIEW EXERCISES

This column lists the references for and number of items (questions) that make up the volume review exercises. The questions are all four-alternative, multiple-choice type items.

CE ITEM NUMBER

This column shows the Course Examination (CE) numbers of the CE questions which are matched to the VREs and objectives covering the content area listed.

CE QUESTION TYPE

This column shows the type of the Course Examination questions referenced in the previous column. All CE questions are classified on the basis of the following three categories:

Perceptual - The stem and the correct alternative closely match the word-by-word form presented in a single sentence of the text. This type of question may appear in an inverted order from that found in the text. Also, this question type could be answered on the basis of the orthographic features of the text.

Example:

CE Question

The Three authorized inspection concepts used in the Air Force are

a. periodic, intermediate, & phased
b. crew, intermediate, and major & minor
c. periodic, phased, and major & minor
d. periodic, phased, and dock

CDC Text

1-3. Inspection Concepts. Authorized inspection concepts are (1) periodic, (2) phased, and (3) minor and major. (These concepts will be . . . . .)

Linguistic - There is no paraphrasing of substantive words from the question to the textual presentation. The word order may or may not be inverted from the question to the text and key elements of the answer to the question are separated by one or more sentences in the text.

Example:

CE question

24. During aerial cargo delivery, the pilot signals to drop the load by

a. voice communication
b. sounding a horn
c. illuminating a green light
d. illuminating a red light

CDC Text

16-31. Aerial Delivery Systems. The term "aerial delivery" as used in this chapter means the airdrop of cargo and personnel. Cargo type . . . The pilot or copilot sounds the horn as the drop zone is neared. He illuminates the red light as a signal to get ready to drop the load. Green light illumination is the signal to drop the load.

Semantic - Must involve some or all paraphrasing of substantive words and/or requires prior knowledge regarding the subject area in order to answer the question.

Example:

CE Question

2. A red diagonal line penciled on an aircraft maintenance form indicates that

a. the aircraft is unsafe for flight
b. compliance with an urgent action TCTO is overdue
c. a condition exists that may restrict use of the aircraft
d. a required scheduled inspection has not been completed

CDC Text

d. The *red diagonal* indicates a condition that does not cause the aircraft to be grounded. To clear the aircraft for flight, either the pilot or the maintenance officer must sign a release.

FIGURES, TABLES, CHARTS, ETC.

This column provides the references for all the figures, charts, tables, etc. that were presented and referred to in the textual narrative covering the content area in the CDC materials.

STS

This column shows the Speciality Training Standard references that match the content area to the appropriate section of the STSs for the Maintenance Cluster AFSCs.

AIR FORCE MAINTENANCE TOPICS

CONTENT AREA	AFSC	REFERENCES								
		Objective		Text Discussion	Chapter Review Exercises	Volume Review Exercises	CE Item No.	CE Quest Type	Figures, Tables, Charts, Etc.	STS
		No.	Ref.							
Aircraft Primary Flight Control System (Elevators, Rudder, Ailerons - Functions and Rotation Axis in Flight)	42152	Guide # 300	WB 3, p 1	Vol 3, p 5-6, P 2-19 thru 2-23	WB 3, p 2-3, Ch 1, Items 9,11,12	WB 3, p 20, Items 8 & 9	52	L	Vol 3, p 5, Fig 3	10. c.d.
	43151A	Guide # 111	WB 1, p 1	Vol 1, p 50-51, P 13-1, 13-3, & 13-4 thru 13-6	WB 1, p 13, Ch 4, Items 1,2,3	WB 1, p 36, Items 51,52,53	—	—	Vol 1, p 51, Fig 19	14. a.
	43151C	BO # 400	Vol 3, p 1	Vol , p 1-2, P 1-1	Vol , p. 6 Items 1,2,3,4	Vol 3, VREp 2 Items 1,2	--	—	Vol 3, p 2, Fig 1-1 Vol 3, p 3, Fig 1-2	14. a.
	43151F	BO # 433	Vol 3, p 42	Vol 3, p 42,43 P 3-1	Vol 3, p 43, Items 1,2,3,4,5	Vol 3, VREp 8 Items 63,64, 65,66	65	L	Vol 3, p 43, Fig 3-1	14. a.
	43151E	Guide # 314	WB 3, p 1	Vol 3, p 64-65, P 15-1 thru 15-7	WB 3, p 13-14, Items 1,2,3,4	WB 3, Items 84,85,86	—	—	Vol 3, p 65, Fig 87	18. a.b.
Aircraft Auxiliary Flight Control System (Tabs, Flaps, Spoilers - Operation and Flight Control Linkage Systems)	42152	Guide # 300	WB 3, p 1	Vol 3, p 6-8, P 2-27 thru 2-33 & 2-35 thru 2-39	WB 3, p 3, Ch 1, Items 13,14,15, 16	WB 3, p 21, Items 10,11,12	51 54	S L	Vol 3, p 7, Fig 6,7 Vol 3, p 8, Fig 8	10. c.d.
	43151A	Guide # 111	WB 1, p 1	Vol 1, p 51-53, P 13-11thru13-18	WB 1, p 13-14, Ch 4, Items 4,5,6,7,8,9	WB 1, p 36, Itm 54	14 18	P L	Vol 1, p 51,Fig 20; Vol 1, p 52,Figs 21 & 22; Vol 1, p 53,Fig 23	14. a.
	43151C	BO # 402	Vol 3, p 10	Vol 3, p 10,12, 13, P 1-2	Vol 3, p 15, Item 1,2,5,6, 14,15	Vol 3, p 2-3, Items 9,10	--	—	Vol 3, p 10,Fig 1-7, 1-8; p 11,Fig 1-9; p 12, Fig 1-10	14. a.
	43151F	BO # 434 435	Vol 3, p 43, 44	Vol 3, p 43,44 P 3-1	Vol 3, p 44, Item 1-5&1-4	Vol 3, p 8-9, Items 67,68, 69,70	—	—	Vol 3, p 43,Fig 3-2 //	14. a.
	43151E	Guide # 314	WB 3, p 1	Vol 3, P 16-1 thru 16-20	WB 3, p 14-15, Items 6,7,8,9, 10,11,12,13,14	WB 3, p 37, Items 88,89, 90,91,92	—	—	Vol 3, p 66,Fig 88, 89,90,91; p 67, Fig 92; p 68, Fig 93thru96	18. a.b.
Ground Handling of Aircraft (Towing, Parking, and Mooring)	42152	-------	-------	----------	----------	----------	--	--	----------	----
	43151A	Guide # 105 106	WB 1, p 1	Vol 1, p 24-28, P 7-1 thru 7-32; p 29-32, P 8-14 thru 8-31	WB 1, p 8,9,10, Items 44 thru57, & 61 thru 72	WB 1, p 33,44, Items 27thru31, & 33 thru 35	9 10 11	S S S	WB 1, p 27,Fig 6; p 30, Fig 7; p 31, Fig 8; p 32,Fig 9	10. j.k.
	43151C	BO # 202 thru 206	Vol 2, p 4, 5,7,8	Vol 2, p 4-8, P 1-2	Vol 2, p 4, Itm 1-2; p 5, Itm 1-4; p 7, Itm 1-3; p 8, Itm 1-4&5	Vol 2, VREp 3, Items 12 - 14	50 54	P P	Vol 2, p 6, Fig1-1; p 9, Fig 1-2	10. j.k.
	43151F	BO # 225 thru 230, 232 - 234	Vol 2, p 31, 32,35 - 38	Vol 2, p 30-39, P 2-2	Vol 2, p 30, Itm 1-2; p 31, Itm 1-6; p 32, Itm 1-4; p 34, Itm 1-3; p 36, Itm 1-2&4 p 37, Itm 1-3; p 40, Itm 1-3	Vol 2, VREp7-8 Items 44 - 60	38 40 41	S L P	Vol 2, p 33, Fig2-2 p 37, Fig 2-4; p 39, Fig 2-5	10. j.k.
	43151E	Guide # 101 102	Study Guide p 1	Vol 1, P 2-1 thru 2-25	Vol 1, p 25,26, Item 17 - 26	Vol 1, VREp2-4 Items 6,22,23, 24,15	3 6	L L	Vol 1, p 12, Fig18; p 13, Fig 19; p 14, Fig 20	10. a.

BO = Behavioral Objective
WB = Workbook

Vol = Volume
p = page
P = Paragraph
Ch = Chapter

Itm = Item
VRE = Volume Review Exercises

S = Semantic
L = Linguistic
P = Perceptual

STS = Specialty Training Standard

AIR FORCE MAINTENANCE TOPICS

CONTENT AREA	AFSC	REFERENCES								
		Objective		Text Discussion	Chapter Review Exercises	Volume Review Exercises	CE Item No.	CE Quest Type	Figures, Tables, Charts, Etc.	STS
		No.	Ref.							
Aircraft Wheels and Tires (Types and Construction Features)	42152	—	—	—	—	—	—	-	—	—
	43151A	Guide #206	WB 2, p 1	Vol 2, p 34-39 P 7-1 - 8-27	WB 2, Ch 2, p 7,8 Its 25-43	WB 2, VREp28,29 Its 38-45	34 35	L S	Vol 2, p 34, Fig 18; p 35, Figs 19,20; p 36, Fig 21	12.g.i.
	43151C	BO 411,412	Vol 3, p 39,41	Vol 3, p 39-43	Vol 3, p 41, Its 1-6; p 43, Its 1-6	Vol 3,VREp 5 Its 28-31,33	75 82	L L	Vol 3, p 39, Figs 2-12, 2-13; p 40, Figs 2-14, 2-15; p 41, Fig 2-16	12.i.k.
	43151F	BO 418,419	Vol 3, p 26,27	Vol 3, p 26-29 P 2-2	Vol 3, p 27, Its 1-7; p 29,30,Its1-8	Vol 3,VREp 5,6 Its 39-43	58	L	Vol 3, p 26, Fig 2-6; p 27, Fig 2-7; p 28, Fig 2-8	12.g.i.
	43151E	Guide #421	Stdy Guide p 2	Vol 4, p101-106 P 21-1 - 21-20	Vol 4, p 115 Its 5,6,7	Vol 4,VRE p 9 Its 68,71,84	114	P	Vol 4, p 101, Fig 100; p 102, Figs 101,102; p 103, Fig 103	16.c.d.
Aircraft Brake Systems (Essential Features, Operation, and Safety Precautions)	42152	Guide #224 thru 228	WB 2, p 2	Vol 2, p 92-108 P 26-1 - 26-11, 27-1 - 31-14	WB 2, p 16,17 Its 20-33	WB 2,VREp40-41 Its 82-95	47 48 50	S S S	Vol 2, p 94, Figs 108, 109; p 95, Figs 110,111; p 96, Figs 113,114; p 97, Fig 115; p 98, Fig 116; p 100, Fig 117; p 101, Fig 118; p 106, Fig 122	16.a.b.
	43151A	Guide #207	WB 2, p 1	Vol 2, p 39-44 P 9-1 - 9-25	WB 2, p 9 Its 45-49	WB 2,VREp29,30 Its 46-52	36	S	Vol 2, p 40, Fig 22; p 41, Fig 23; p 43, Figs 24,25; p 44, Fig 26; p 45, Fig 27	12.a.h.j.
	43151C	BO 413,414 415	Vol 3, p 43,48,52	Vol 3, p 43-53 P 2-1	Vol 3, p 48, Its 1-8; p 52,Its 1-6; p 53, Its 1-3	Vol 3,VREp 5,6 Its 34-40	73 74 75	S P L	Vol 3, p 44, Fig 2-18; p 45, Fig 2-19; p 46, Fig 2-20; p 47, Fig 2-21; p 48, Fig 2-22; p 49, Fig 2-23; p 50, Fig 2-24; p 51, Fig 2-25	12.a.j.l.
	43151F	BO 420	Vol 3, p 30	Vol 3, p 30-32 P 2-2	Vol 3, p 32 Its 1-7	Vol 3,VREp 6,7 Its 44-46	59 61	S P	Vol 3, p 29, Fig 2-9; p 31, Fig 2-10	12.a.h.j.
	43151E	Guide #419, #420	Stdy Guide p 2	Vol 4, p 93-101 P 20-1 - 20-29	Vol 4, p 115 Its 1-4	Vol 4, p 8,9 Its 67,70,72, 75,77-79,83, 87,89	112	S	Vol 4, p 94, Fig 90; p 95, Figs 91,92; p 96, Fig 93; p 97, Fig 94; p 98, Fig 95; p 99, Figs 96,97; p 100, Fig 98; p 101, Fig 99	16.a.b.c.
Aircraft Fuel Systems Components (Tank Types, Pumps, Valves, Strainer, Fuel Transfer System)	42152	—	—	—	—	—	—	-	—	—
	43151A	Guide #400	WB 4, p 1	Vol 4, p 1-6 P 1-1 - 2-26	WB 4, Ch 1, p 2,3, Its 1-7	WB 4, VREp30,31 Its 1-7,15	67	S	Vol 4, p 3, Figs 2,3; p 4, Figs 3,4,5; p 5, Figs 6,7; p 6, Fig 8; p 7, Fig 9	17.a.
	43151C	BO 600,601 602	Vol 4, p 1,4,7	Vol 4, p 1-7 P 1-1 - 1-3	Vol 4, p 4, Its 1-8; p 67, Its 1-4, 1-6	Vol 4,VREp 2,3 Its 1-10	86 88	L L	Vol 4, p 2, Fig 1-1; p 3, Figs 1-2,1-3; p 5, Fig 1-4; p 6,Fig1-5	17.a.
	43151F	BO 800, 801,802	Vol 5, p 1,5,6	Vol 5, p 1-6 P 1-1	Vol 5, p 3, Its 1-8; p 5-7,Its 1-7 & 1-8	Vol 5,VREp 2,3 Its 1-10	103	P	Vol 5, p 2, Fig 1-1; p 4, Fig 1-2	17.a.
	43151E	Guide #306, #307	WB 3, p 1	Vol 3, p 28-38 P 6-1 - 7-34	WB 3, Ch 2, p 7,8,Its 1-23	WB 3,VREp 31-33 Its 36-47	70 72 74 79	P P P L	Vol 3, p 29, Fig 29; p 30, Fig 30; p 32, Figs 31,32; p 33, Figs 33,34; p 34, Figs 35,36, 37; p 35, Figs 37 - 40; p 36, Figs 41-43; p 37, Figs 44-46; p 38,F 47,48	19.a.

BO = Behavioral Objective
WB = Workbook

Vol = Volume
Ch = Chapter
p = page
P = Paragraph

It = Item (or I)
VRE = Volume Review Exercises

S = Semantic
L = Linguistic
P = Perceptual

STS = Specialty Training Standard

CONTENT AREA	AFSC	REFERENCES								
		Objective		Text Discussion	Chapter Review Exercises	Volume Review Exercises	CK Item No.	CK Quest Type	Figures, Tables Charts, Etc.	STS
		No.	Ref.							
Main Landing Gear (Shock Struts, Linkage Devices, Electrical and Hydraulic Retraction and Extension Operations)	42152	Guide #217	WB 2, p 2	Vol 2, p 65-68, P 18-1 - 18-19	WB 2, Ch 5, p 12,13, Its 1-9	WB 2, VREp36,37 Its 59-62	43	L	Vol 2, p 66, Figs 82,83 p 67, Fig 84	14.a.
	43151A	Guide #203, #204	WB 2, p 1	Vol 2, p 20-26 P 4-1 thru 4-6 5-1 - 5-19	WB 2, p 5,6 Its 1-10	WB 2, VREp 27 Its 24-32	70 71 72	S S L	Vol 2, p 21, Fig 10; p 22, Fig 11; p 23, Fig 12; p 25, Fig 13; p 26, Fig 14; p 22, Fig 15	12.a.
	43151C	BO 408,409	Vol 3, p 26,27	Vol 3, p 26-33 P 2-1	Vol 2, p 27 Its 1-3; p 33, Its1-21	Vol 2, VREp 4, Its 22-27	62	S	Vol 2, p 27, Fig 2-1; p 28, Fig 2-2; p 29, Fig 2-3; p 32, Fig 2-4	12.a.
	43151F	BO 415,416	Vol 3, p 18,21	Vol 2, p 18-24 P 2-1	Vol 3, p 21 Its 1-9; p 24,25,Its1-7	Vol 3, VREp 5, Its 30-36	57	F	Vol 3, p 19, Fig 2-1; p 20, Fig 2-2; p 22, Fig 2-3; p 23, Fig 2-4	12.a.
	43151E	Guide #416, #417	Stdy Guide p 2	Vol 4, p 78-86 P 18-1 - 18-48	Vol 4, p 90 Its 13-20	Vol 4, VREp 7,8 Its 51,56-58, 61,63	110 113	S L	Vol 4, p 79, Fig 81; p 80, Fig 82; p 81, Fig 83; p 82, Fig 84; p 83, Fig 85; p 84, Fig 86	14.a.b.
Aircraft Jacking (Hydraulic Jacks and Accessories and Jacking Procedures)	42152	Guide #404	WB 4, p 1	Vol 4, p 18,19 P 4-12 - 4-21	WB 4, Ch 1, p 5, Its 38 - 45	WB 4, VRE p 20, Its 12 - 21	17 18	L L	Vol 4, p 18, Figs 13,14; p 15, Fig 15	19.b.c.
	43151A	Guide #107	Vol 1, p 1	Vol 1, p 33-37 P 9-1 - 9-34	WB 1, p 10,11, Its 73 - 83	WB 1, p 34,35 Its 37 - 40	12 13	S F	Vol 1, p 34, Fig 10; p 35, Fig 11	10.1. 19.(2)
	43151C	BO 207,208 209,210	Vol 2, p 8,14,15	Vol 2, p8-15, P 1-2	Vol 2, p 10, It 1; p 14, Its 1-4; p 15, Its 1-3; p 15, Its 1,2	Vol 2, VRE p3,4 Its 15 - 20	--	-	Vol 2, p 11, Fig 1-3; p 12, Fig 1-4; p 15, Fig 1-5	10.b.
	43151F	BO 235,236 237,238	Vol 2, p 40,41, 42,45	Vol 2, p 40-46 P 2-4	Vol 2, p 41, Its 1-4; p 42, Its 1,2; p 45, Its 1-6; p 46, Its 1-4	Vol 2, VREp 8,9 Its 15 - 20	43 44	L S	Vol 2, p 40, Fig 2-6; p 41, Fig 2-7; p 43, Fig 2-8; p 44, Fig 2-9; p 45, Fig 2-10	10.1 19.2
	43151E	Guide #104 #103	Stdy Guide p 1	Vol 1, p 16-21 P 4-1 - 4-23	Vol 1, p 26,27 Its 28-42	Vol 1, p 3,4, Its 8,13,26	10	S	Vol 1, p 16, Fig 21; p 18, Fig 22,23; p 24, Figs24-26; p 30, Fig 27	9.b.
Airframe Construction, Markings, and Location Reference System (Airframe Structural Units, Identification Markings, and Location Reference System)	42152	Guide #301	WB 3, p 1	Vol 3, p 9-13 P 3-1 - 4-22	WB 3, p 3,4, Its 17-23	WB 3, p 21,22, Pts 14 - 18	53 55 56	S L L	Vol 3, p 8, Fig 9; p 9, Fig 10; p 12, Fig 12	10.a.b.
	43151A	Guide #102, #108, #109	WB 1, p 1	Vol 1, p 7-10, P 4-1 - 4-33; p 38 - 41, P 10-1 - 10-10, 10-14- 10-16, 11-1 - 11-3	WB 1, p 11,12, Its 1,2,3,5-8	WB 1, p 35,36 Its 10-13;41-49	3 4 14 15 16	L F L L F	Vol 3 p 8, Fig 1; p 38, Fig 12; p 42, Fig 13; p 43, Fig 14	11.a.
	43151C	BO 218	Vol 2, p 29	Vol 2, p 29-42, P 2-1	Vol 2, p 42, Its 1-5	Vol 2, VREp 5,6 Its 31-40	52 56	L L	Vol 2, p 30, Fig 2-1; p 31, Fig 2-2; p 33, Fig 2-3	11.a.
	43151F	BO 200, 201	Vol 2, p 1,5	Vol 2, p 1-5, P 1-1	Vol 2, p 5, Its 1-5 & 1-3	Vol 2, VRE p Its 1-4	26	S	Vol 2, p 6, Fig 1-5; p 7, Fig 1-6; p 2, Fig 1-1; p 3, Figs 1-2, 1-3,1-4	11.a.
	43151E	Guide #100, #200, #201	Stdy Guide p 1	Vol 1, p 1-6, P 1-1 - 1-31; p 1-4, P 1-1 - 1-4	Vol 2, p 27, Its 1-4; p 24,25, Its 1 - 16	Vol 1, VRE p 2, Its 4,7,10,16, 18,25; Vol 2, VRE p 2, Its 1,3,4,7	1 2 4 28 29	L L L S L	Vol 1, p 2, Fig 1; p 4, Figs 4-6; p 5, Fig 7; Vol 2, p 4, Fig 4; p 5, Fig 5; p 6, Fig 6	10.a.c.
Aircraft Metal Corrosion (Definition of Corrosion, Characteristics of Different Types, and Control Procedures)	42152	Guide #115	WB 1, p 1	Vol 1, p 87-90 P 18-1 - 18027	WB 1, p 14,15 Its 27-41	WB1,VREp 39,40 Its 102 - 107	22,24 23	L S	Vol 1, p 88, Fig 91	11.b.
	43151A	Guide #104	WB 1, p 1	Vol 1, p 18-20 P 6-1 - 6-18	WB 1, p 7,8 Its 35-39	WB 1,VRE p 32 Its 22 - 25	--	-	--	10.h.
	43151C	BO 216, 217	Vol 2, p 21,25	Vol 2, p 21-28 P 1-4	Vol 2, p 25, Its 1-4; p 28, Its 1-4	Vol 2,VREp 4,5 Its 26 - 30	49	F	Vol 2, p 22, Fig 1-9; p 23, Fig 1-10, p 26, Figs 1-11&12;p27,F 1-13	10.h.
	43151F	BO 219, 220, 221	Vol 2, p 21-23	Vol 2, p 21-24 P 1-5	Vol 2, p 22, Its 1-3; p 23, ITS 1-6; p 24, ITS 1-3	Vol 2,VRE p 5,6 Its 34-38	35 37 39	L L P	--	10.h.
	43151E	Guide #105	Stdy Guide p 1	Vol 1, p 22-24 P 5-1 - 5-15	Vol 1, p 27, Its 43-48	Vol 1,VRE p3,4 Its 9,17	7 9	L P	Vol 1, p 20, Fig 28; p 21, Figs 29,30; p 22, Figs 31,32; p 23, Figs 33,34	10.d.

BO = Behavioral Objective
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AIR FORCE MAINTENANCE TOPICS

CONTENT AREA	AFSC	REFERENCES								
		Objective		Text Discussion	Chapter Review Exercises	Volume Review Exercises	CE Item No.	CE Quest Type	Figures, Tables Charts, Etc.	STS
		No.	Ref.							
Aircraft Maintenance Directives (Technical Orders Filing System, Types, Numbering, and Change Procedures)	42132	Guide #102, #103	WB 1, p 1	Vol 1, p 8-28 P 4-1 thru 5-49	WB 1, Ch 2, p 56, Its 1-20	WB 1, VRE p 28,29,30 Its 15-32	3 5 6 7	L L S L	Vol 1, p 11, Fig 4; p 12, Fig 5; p 13, Fig 6 p 15, Fig 7; p 16, Fig 8 p 18, Fig 9; p 21, Fig10 p 22, Fig 11; p 24, Fig 12; p 25, Fig 13; p 26, Fig 14; p 27,Fig15	4.a.b.c. d.e.
	43151A	--	--	--	--	--	--	-	--	4.a.b.
	43151C	BO 011 thru 025	Vol 1, p 11 - 19	Vol 1, p 11-20 P 2-1,2-2	Vol 1, p 12, Its 1-4, 1-2; p 13,Its 1,2x4; p 14, Its 1,2; p 16, Its 1-4; p 17, Its 1-5, 1-3; p 18, Its 1-6; p 20, Its 1-7	Vol 1, VREp5,6 Its 19-40	7 9 19 21	P S P L	Vol 1, p 11, Fig 2-1; p 15,Fig 2-3; p 16, Fig 2-4; p 19,Fig2-5	4.a.b.
	43141F	Same as "C" above	Same as "C" above	Same as "C" above	Same as "C" above	Same as "C" above	7 9 10 11	S S L L	Same as "C" above	4.a.b.
	43151E	--	--	--	--	--	--	-	--	4.a.b.c.
Aircraft Basic Hydraulic Systems (Hydraulic Principles, Basic Components and Operation and and Maintenance Function)	42132	Guide #205	WB 2, p 1	Vol 2, p 10-14 P 7-1 - 7-28	WB 2, Ch 1, p 4,5, Its 17-27	WB 2, VRE p30 Its 17-19	30	P	Vol 2, p 10, Fig 14; p 11, Figs 15,16; p 12, Fig 17; p 13, Figs 18, 19	12.a.
	43151A	Guide #200	WB 2, p 1	Vol 2, p 1-4, P 1-1 - 1-10	WB 2, Ch 1, p 2, Its 1-6	WB 2, VREp 24 Its 1-3	26	L	Vol 2, p 2, Fig 1; p 3, Fig 2	13.a.
	43151C	BO 230	Vol 2, p 77	Vol 2, p 76-78 P 4-1	Vol 2, p78,79 Its 1-7	Vol 2, VREp10 Its 76-84	32	L	Vol 2, p 77, Fig 4-1	13.a.
	43151F	BO 400,401	Vol 3, p 1,3	Vol 3, p 1-5 P 1-1	Vol 3, p 3, Its 1-14; p 6,Its 1-8	Vol 3, VREp 2 Its 1-9	51 53	P S	Vol 3, p 4, Fig 1-1	13.a.
	43151E	Guide #401	Stdy Guide p 2	Vol 4, p 6-10 P 2-1 - 2-25	Vol 4, p42,43 Its 13 - 23	Vol 4, VREp2,3 Its 3,11,15,17, 26,31	95	S	Vol 4, p 6, Figs 7,8; p 7, Figs 9,10; p 8, Figs 11, 12	13.a.
Aircraft Fire Warning and Extinguishing Systems (System Types and Operations, Fire Extinguishing Agents)	42132	Guide #106	WB 1, p 1	Vol 1, p 41,42 P 9-10 - 9-14	WB 1, p 8, It 3	WB 1, VR.p 32 It 50	--	-	Vol 1, p 42, Fig 20	3.c.
	43151A	Guide #406, #407	WB 4, p 1	Vol 4, p 27-35 P 13-1 - 13-14 14-1 - 14-28	WB 4, p 10-12 Its 1-24	WB 4,VREp35,36 Its 39-50	76 77 78	S S S	Vol 4, p 28, Fig 19; p 29, Figs 20,21; p 31, Fig 22; p 32, Fig 23; p 33, Fig 24; p 34, Fig 25	13.b.
	43151C	BO 440,441 BO 617	Vol 3, p 100,102 Vol 4, p23	Vol 3, p 100-103 P 3-3; Vol 4, p 23, P 2-2	Vol 3, p 102, Its 1-10; p 103, Its 1-6; Vol 4, p 23, Its 1-3	Vol 3,VREp 10 Its 73-75; Vol 4,VREp 7 It 49	--	-	Vol 3, p 101, Fig 3-8; Vol 4, p 23, Fig 2-10	13.b.
	43151F	BO 608,609	Vol 4, p 16,20	Vol 4, p 16-21 P 2-1 thru 2-2	Vol 4, p 19, Its 1-6; p 21, Its 1-5	Vol 4,VREp 6,7 Its 39-48	81 83 84 85	S L L L	Vol 4, p 17, Fig 2-1; p 18, Figs 2-2,2-3; p 19, Fig 2-4; p 20, Fig 2-5	13.b.
	43151E	Guide #113	Stdy Guide p 1	Vol 1, p61-65 P 19-1 - 19010	Vol 1, p 71 Its 2-6	Vol 1,VREp 8,9 Its 65,71,75	22 27	S L	Vol 1, p 63, Fig 61; p 64, Fig 62	28.a.b.
Supervision (Definition, Management Functions - Planning, Coordinating, Directing, Controlling, Evaluating)	42132	Guide #411	WB 4, p 1	Vol 4, p 41-42 P 13-1 - 13-10	WB 4, p 9 Its 1,2	WB 4,VREp 25,26 Its 55-57	96 97	S L	--	6.a.
	43151A	--	--	--	--	--	--	-	--	5.a.
	43151C	BO 043 thru 051	Vol 1, p 41-54	Vol 1, p 41-54 P 4-1	Vol 1, p42,43 Its 1,2; p 43, Its 3-4; p 45, Its 1-7; p 46, Its 1-6; p 48, Its 1-4; p 49, Its 1-4; p 51, Its 1-5; p 54, Its1-10	Vol 1,VREp10-12 Its 80-96	2 6 23 26	S P L P	Vol 1, p 41, Fig 4-1; p 42, Fig 4-2; p 45, Fig 4-3; p 47, Fig 4-4; p 49, Fig 4-5; p 51, Fig 4-6; p 52, Fig 4-7	5.a.
	43151F	Same as "C" above	Same as "C" above	Same as "C" above	Same as "C" above	Same as "C" above	18 19 20 21	L P L L	Same as "C" above	5.a.
	43151E	Guide #106	Stdy Guide p 1	Vol 1, p 30,31 P 6-1 - 6-7	Vol 1, p 34 Its 1-7	Vol 1, p 5 It 31	11	S	--	11.a.

AIR FORCE NON MAINTENANCE TOPICS

CONTENT AREA	AFSC	REFERENCES								
		Objective		Text Discussion	Chapter Review Exercises	Volume Review Exercises	CE Item No.	CE Quest Type	Figures, Tables, Charts, Etc.	STS
		No.	Ref.							
Career Field Progression (Skills Upgrading Process, Skill Levels, Career Field General Structure)	70250	BO 001, 006, 019, 020	Vol 1, p 1,7,23, 26	Vol 1, p 1,2, 3,7,8,23-26	Vol 1, p 3, Its 1-4; p 8, Its 1-4; p 26, Its 1-7	Vol 1, VRE p 2 Its 1-4, 11-13, 37-40	4 5 11 13	S L P S	Vol 1, p 2, Fig 1-1; p 25, Fig 3-5	1.a.
	64550	Guide #100	WB 1, p 1	Vol 1, p 1-5, P 1-1 thru 2-5	WB 1, p 2,3, Its 1-10	WB 1, VRE p 34, Its 1-3	—	-	Vol 1, p 2, Fig 1-1	1.a.b.
	64750	Guide #100	WB 1, p 1	Vol 1, p 1-5, P 1-1 thru 2-5	WB 1, p 2-5, Its 1-22	WB 1, VRE p 32, Its 1-5	3 4 6	S S S	Vol 1, p 2, Fig 1	1.a.b.
Communications Security (Security Classification Methods of Transmission, Accountability of Classified Items)	70250	BO 262, 263, 264, 266	Vol 2, p 111, 112, 113, 115	Vol 2, p 116, 117, P 3-1 thru 3-4, 3-6	Vol 2, p 111, Its 1-3; p 113, Its 1-4; p 114, Its 1-3; p 117, Its 1-3	Vol 2, VRE p 14,15, Its 113-117	56 58 59	P S S	Vol 2, p 112, Fig 3-1; p 115, Fig 3-2; p 116, Fig 3-3	2.a,b.c.d
	64550	Guide #309	WB 5, p 1	Vol 5, p 63,66,67 P 28-1 - 28-21	WB 5, p 16, Ch 6, Its 1-8	WB 5, VRE p 38,39 Its 80-85	82	P	Vol 5, p 66, Fig 6-1; p 67, Fig 6-2	2.a.b.c.d
	64750	—	—	—	—	—	—	-	—	2.a.b.c.d
Supervision (Definition, Management Functions - Planning, Coordinating, Directing, Controlling, Evaluating)	70250	BO 011, 012, 013, 016	Vol 1, p 14,17, 18,19	Vol 1, p 14-19, P 3-1 - 3-3,3-4	Vol 1, p 17, Its 1-4; p 18, Its 1-4; p 19, Its 1-3	Vol 1, VRE p 4,5, Its 22-25,28	7 9	P S	Vol 1, p 15, Fig 3-1; p 16, Fig 3-2	3.a.(1,2,5
	64550	—	—	—	—	—	—	-	—	3.a.(1,2,5
	64750	—	—	—	—	—	—	-	—	3.a.(1,2,5
Training (Plan Conduct OJT, Training Methods and Principles, Maintaining JPGs and AF Form 623)	70250	BO 021, 023, 024, 025	Vol 1, p 26,32, 37,39	Vol 1, p 26-28, 32-36, 37-39, P 3-11, 3-13, 3-14, 3-15	Vol 1, p 36-37, Its 1-12; p 36, 37, Its 1-23; p 39, Its 1-7; p 39,40, I 1-6	Vol 1, VRE p 6,7,8, Its 41-45, 48-59	14 15 18 19 20	S P S S S	Vol 1, p 27, Fig 3-4	3.b.(1)(2)
	64550	—	—	—	—	—	—	-	—	3.b.(3)(4)
	64750	—	—	—	—	—	—	-	—	3.b.(1)(2)
Supply Requisitions (Supplies & Equipment Custodial Accounts, Submission Procedures, Controlling Documents and Forms)	70250	BO 018, 026, 027	Vol 1, p 22,41, 42	Vol 1, p 22,23, 41,42, P 3-8, 4-1	Vol 1, p 23, Its 1-8; p 42, Its 1-4 & 1a-e	Vol 1, VRE p 56,58, Its 33-36,60, 61	12 22	L L	—	4.a.
	64550	Guide #402, #404	WB 4, p 2	Vol 4, p 9-12, P 1-1 thru 1-3; p 23-27, P 4-1 thru 4-9	WB 4, p 4,6, Its 1,2,18-20	WB 4, VRE p 31,33, Its 14-16,25-28	14 26	L L	Vol 4, p 10, Fig 2-1, 2-2; p 11, Fig 2-3; p 24, Fig 2-11; p 25, Fig 2-12	13.a.b.e.g
	64750	Guide #302, #303	WB 3, p 1	Vol 3, p 10-14, P 8-1 thru 9-14; p 16,17, P 12-1 thru 12-9	WB 3, p 9, Ch 3, Its 1-13, 20,22	WB 4, VRE p 36, Its 19-25,34-36	52 54 55	S S L	Vol 3, p 11, Fig 1; p 12, Fig 2; p 17, Fig 5	9.a.b.c.
Publication Management (System, Updating Procedures, and Files)	70250	BO 401, 408 - 415	Vol 3, p 3, 22,23,24, 25,27,28	Vol 3, p 3,4, P 1-2; p 22-28, P 1-7 thru 1-9	Vol 3,p 3,11-7; p 23, Its 1-5; p 24, Its 1-4; p 25, Its 1-4; p 26, Its 1-13; p 28, Its 1-7; p 29, Its 1-4	Vol 1, VRE p 2,3-7 Its 4-7,34-51	69 70 71 72 73	L P L P P	Vol 3, p 27, Fig 1-14;	5.d.e.
	64550	—	—	—	—	—	—	-	—	—
	64750	—	—	—	—	—	—	-	—	—
Air Force Messages (Types of Official, Quasi-Official Messages, Precedence Categories, and MINIMIZE Conditions	70250	BO 229, 230	Vol 2, p 49, 53	Vol 2, p 49 - 56 P 2-8	Vol 2, p 53, Its 1-5; p 53-56, Its 1-4	Vol 2, VRE p 7,8, Its 53 - 59	41 42	S L	Vol 2, p 50, Fig 2-21; p 52, Fig 2-22; p 54, Fig 2-23.	7.a.(2)
	64550	—	—	—	—	—	—	-	—	—
	64750	—	—	—	—	—	—	-	—	—

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AIR FORCE NON-MAINTENANCE TOPICS

CONTENT AREA	AFSC	REFERENCES								
		Objective		Text Discussion	Chapter Review Exercises	Volume Review Exercises	CE Item No.	CE Quest Type	Figures, Tables, Charts, Etc.	STS
		No.	Ref.							
Administrative Orders (Purpose, Types, Preparation, Changes)	70250	BO 447, 449, 450, 453	Vol 3, p 71, 73, 75, 78	Vol 3, p 71, P 5-1; p 73, P 5-2; p 75-76, P 5-3; p 78, P 5-4	Vol 3, p 71, I, 1-3; p 73,75, I, 1-4; p 76,77, I, 1-19; p 78, I, 1-5	Vol 3, VRE p 13, 14 Its 105, 106, 111, 114, 117-119	87 88 89 94	P L L L	Vol 3, p 72, Fig 5-1; p 74, Fig 5-2	7.a.(4)
	64550	—	—	—	—	—	—	-	—	—
	64750	—	—	—	—	—	—	-	—	—
Basic Supply Manual (Purpose, Format, and Updating Procedures)	70250	—	—	—	—	—	—	-	—	—
	64550	Guide #103	WB 1, p 1	Vol 1, p 38-43, P 4-1 thru 4-30	WB 1, p 9, 10, Ch 3, Its 41-46	WB 1, VRE p 38 Its 40 - 43	17	S	Vol 1, p 40, Fig 3-4; p 41, Fig 3-4	8.g.h.
	64750	Guide #103, #104	WB 1, p 1	Vol 1, p 16-23, P 8-1 thru 9-15	WB 1, p 8 - 12, Ch 3, Its 1-28	WB 1, VRE p 34, 35, Its 16 - 23	19 22	P S	Vol 1, p 17, Fig 7; p 20, Fig 8a; p 21, Fig 8b	5.b.
Supply Item Identification (Purpose, Classification Structure, Item Identification Elements, and Basic Supply Catalogs)	70250	—	—	—	—	—	—	-	—	—
	64550	Guide #101, #103	WB 1, p 1	Vol. 1, p 20-37, P 1-1 thru 3-8	WB 1, p 2-9, Its 1 - 39	WB 1, VRE p 36 - 38, Its 17 - 39	10 11 12 13 14 15 16	S S S P S P P	Vol. 1, p 34, Tbl 2-2; p 39, Fig 2-1; p 30, Fig 2-2; p 32, Fig 2-3; p 33, Fig 2-4; p 35, Fig 2-5	8.g.h.
	64750	Guide #104, #108	WB 1, p 1	Vol 1, p 29-34, P 12-1 - 12-32; p 42, P 15-1,-2	WB 1, p 13 - 15, Its 10 - 28; p 19, It 35	WB 1, VRE p 35,36,38 Its 29 - 33,50	12	S	Vol. 1, p 31, Fig 12; p 32, Fig 13; p 33, Fig 14	5.b.
Publications and Forms Requirements and Distribution System (PDD System, Establishing Requirements, Reviewing Requirements, and Issuing Procedures)	70250	BO 431	Vol 3,p 48	Vol 3, p 48,49 P 3-5	Vol 3, p 49, Its 1 - 12	Vol 3, VRE p 9, Its 75 - 79	80	S		3.c.
		BO 017	Vol 1,p 20	Vol 1, p 19-21, P 3-7	Vol 1, p 21,22, Its 1 - 11	Vol 1, VRE p 3, Its 29 - 32	10	P	Vol 1, p 20, Fig 3-3; p 21, Fig 3-4	
	64550	Guide #103	WB 1, p 1	Vol 1, p 37,38 P 3-9 thru 3-12	WB 1, p 9, Ch 2, It 40	—	—	-	—	8.g.h.
	64750	Guide #108	WB 1, p 1	Vol 1, p 42 43 P 15-3 - 15-7	WB 1, p 36, Its 36, 37	Vol 1,VRE p 7, Its 51, 52	—	-	—	5.b.
Documentation Management (Methods of Arranging Files, AF Subjective Classification System, and Filing Procedures)	70250	BO 245 thru thru 250	Vol 2,p79, 80,83,84, 85	Vol 2, p 78-92 P 4-2, 4-3	Vol 2, p 79, I, 1-2; p 80, I, 1-4; p 83, I, 1-5; p 84, I, 1-2; p 85, I, 1-3; p 92, I, 1-7	Vol 2, VRE p 10,11 Its 82 - 92	51	S	Vol 2, p 81, Figs 4-1,2 p 82, Fig 4-3; p 83, Fig 4-4; p 84, Figs 4-5, 4-6; p 85, Fig 4-7; p 86 Fig 4-8; p 88, Figs 4-9, 4-10;	8.a.b.
	64550	Guide #107	WB 1, p 1	Vol 1, p 67-77, P 1-1 thru 3-2	WB 1, p 17-20 Its 1 thru 30	WB 1, VRE p 9, Its 75 - 84	29 30 31 32	P S L L	Vol 1, p 69, Tbl 4-1; p 70, Tbl 4-2; p 71, Tbl 4-3, Fig 4-1; p 73, Fig 4-2; p 74, Fig 4-3	8.b.1.
	64750	—	—	—	—	—	—	-	—	13.a.b.c
Air Force Letters (Major Elements, Preparation Guidelines, Form Letters and Their Use)	70250	BO 216 thru 228	Vol 3, p 25 - 49	Vol 2, p 25-49, P 2-1 thru 2-7	Vol 2, p 27, I, 1-4; p 30, I, 1-8; p 32, I, 1-8; p 33, I, 1-4; p 35, I, 1-3; p 37, I, 1-2; p 38, I, 1-5; p 40, I, 1-4; p 42, I, 1-2; p 44,45,I,1-4; p 48, I, 1-5	Vol 2, VRE p5-7 Its 30 - 52	35 37 38 39 40	S S S S S	Vol 2, p 26, Fig 2-1; p 27, Fig 2-3; p 28, Fig 2-3; p 29, Fig 2-4; p 31, Figs 2-5,2-6; p 32 Fig 2-7; p 34 Figs 2-8, 2-9; p 36, Fig 2-10; p 37, Figs 2-11,-12; p39 Fig 2-13; p 40, Fig 2-14 p 41, Fig 2-15; p 42, Fig 2-16; p 43, Fig 2-17; p 44, Fig 2-18; p 45, Fig 2-19; p 47, Fig 2-20	7.a.(1)
	64550	—	—	—	—	—	—	-	—	—
	64750	—	—	—	—	—	—	-	—	—
Postal Services (Unit Classifications, and Special Services)	70250	BO 611, 612, 613	Vol 4, p 13,18,20	Vol 4, p 13-25, P 2-1, 2-2	Vol 4, p 18, Its 1-11; p 19, Its 1-6; p 24,25, I 1-14	Vol 4, VRE p 3-5 Its 13-34	100 101 102	S S L	Vol 4, p 14, Fig 2-1; p 15, Fig 2-2; p 16, Fig 2-3	9.a.d.i.
	64550	—	—	—	—	—	—	-	—	—
	64750	—	—	—	—	—	—	-	—	—

BO = Behavorial Objective
WB = Workbook

Vol = Volume
p = page
P = Paragraph
Ch = Chapter

It = Item (or I)
VRE = Volume Review Exercises

S = Semantic
L = Linguistic
P = Perceptual

STS = Specialty Training Standard

APPENDIX C

STRAND II JOB READING MANUAL TOPICS

MAINTENANCE TOPICS

Title	Content Area	Reading Grade Level	Total Word Count
Aircraft Primary Flight Control System	Elevators, Rudder, Ailerons - Functions and Rotation Axis in Flight	8.9	986
Aircraft Auxiliary Flight Control System	Tabs, Flaps, Spoilers - Operation and Flight Control Linkage Systems	9.5	991
Ground Handling of Aircraft	Towing, Parking, and Mooring	9.3	980
Aircraft Wheels and Tires	Types and Construction Features	8.8	1028
Aircraft Brake Systems	Essential Features, Operation, and Safety Precautions	9.4	1011
Aircraft Fuel Systems Components	Tank Types, Pumps, Valves, Strainer, Fuel Transfer System	8.9	1017
Aircraft Jacking	Hydraulic Jacks and Accessories and Jacking Procedures	8.6	1025
Airframe Construction, Markings, and Location Reference System	Airframe Structural Units, Identification Markings, and Location Reference System	9.3	1052
Aircraft Metal Corrosion	Definition of Corrosion, Characteristics of Different Types, and Control Procedures	9.7	1002

MAINTENANCE TOPICS (Continued)

Title	Content Area	Reading Grade Level	Total Word Count
Main Landing Gear	Shock Struts, Linkage Devices, Electrical and Hydraulic Retraction and Extension Operations	8.6	1015
Aircraft Maintenance Directives	Technical Orders Filing System, Types, Numbering, and Change Procedures	9.8	1024
Aircraft Basic Hydraulic Systems	Hydraulic Principles, Basic Components, and Operation and Maintenance Function	9.6	1024
Aircraft Fire Warning and Extinguishing Systems	System Types and Operations, Fire Extinguishing Agents	9.2	1003
Supervision	Definition, Management Functions - Planning, Coordinating, Directing, Controlling, Evaluating	9.1	972

107

NON-MAINTENANCE TOPICS

Title	Content Area	Reading Grade Level	Total Word Count
Career Field Progression	Skills Upgrading Process, Skill Levels, Career Field General Structure	9.7	991
Communications Security	Security Classifications, Methods of Transmission, Accountability of Classified Items	9.4	1002
Supervision	Definition, Management Functions - Planning, Coordinating, Directing, Controlling, Evaluating	9.1	972
Training	Plan and Conduct OJT, Training Methods and Principles, Maintaining JPGs and AF Form 623	9.2	1011
Supply Requisitions	Supplies and Equipment Custodial Accounts, Submission Procedures, Controlling Documents and Forms	9.7	990
Publication Management	System, Updating Procedures, and Files	9.4	968
Administrative Orders	Purpose, Types, Preparation, and Changes	9.6	976
Basic Supply Manual	Purpose, Format, and Updating Procedures	9.3	1016
Supply Item Identification	Purpose, Classification Structure, Item Identification Elements, and Basic Supply Catalogs	9.8	1002

NON-MAINTENANCE TOPICS (Continued)

Title	Content Area	Reading Grade Level	Total Word Count
Publications and Forms and Distribution System	PDO System, Establishing Requirements, Reviewing Requirements, and Issuing Procedures	8.9	1003
Documentation Management	Methods of Arranging Files, AF Subjective Classification System, Filing Procedures	9.2	1028
Air Force Letters	Major Elements, Preparation Guidelines, Form Letters And Their Use	9.2	1074
Air Force Messages	Types of Official, Quasi-Official Messages, Precedence Categories, and MINIMIZE Conditions	9.8	1007
Postal Services	Mail Classifications and Special Services	9.1	1025

109

APPENDIX D

STUDENT POST JOB-ORIENTED READING PROGRAM SURVEY

This appendix presents detailed responses to an attitudinal survey of JORP students' post training. The entire question and its associated scale, and the responses of the sample are shown. In the left margin is shown the percent of students who failed to respond to that question. The total student sample was 93. Where the question calls for an open-ended answer, responses have been categorized and shown at the end of this appendix, referenced by question number.

STUDENT POST JOB-ORIENTED READING PROGRAM SURVEY

NAME SUMMARY OF CLASSES 1-8 N = 93 SS# _____

We are trying to evaluate the effects of the JORP Training Course and need your help. Since you are one of the first graduates of the course, we ask that you fill out the attached survey honestly and that your comments really reflect your opinions or feelings. The information you provide will help us determine how well the JORP course is meeting the needs of the Air Force, and will be kept confidential.

In accordance with paragraph 30, AFR 12-35, Air Force Privacy Act Program, the following information about this survey is provided:

a. Authorities

Title 10 USC, Section 8012, Secretary of the Air Force: Powers and Duties Delegation by; Executive Order 9397, 22 Nov 1943, Numbering System for Federal Accounts Relating to Individual Persons.

b. Principal Purpose

This survey is being conducted to obtain evaluation data on the effectiveness of the Job-Oriented Reading Program (JORP) developed by the Human Resources Research Organization under contract to the Air Force Human Resources Laboratory at Lowry AFB, Colorado.

c. Routine Use

The survey data will be analyzed to provide specific recommendations for program changes in the course prototype. All data will be kept completely confidential.

d. Disclosure

Disclosure is voluntary. No adverse action of any kind may be taken against any individual who elects not to participate in the survey.

USAF SCN 7T24
Sep, 1976 thru Dec, 1976

Percent Not Responding

PLEASE ANSWER THE FOLLOWING QUESTIONS.

1.1 1. Did you like the JORP training course?

5.4	37.6	36.6	14.0	5.4
Liked it very much.	Liked it.	Neither liked nor disliked	Disliked it.	Disliked it very much.

WHY? _____

1.0 2. Do you think the tasks you practiced in the JORP course apply to the reading tasks you do on the job?

9.7	35.5	23.6	27.9	2.2
Very definitely apply.	Most things apply.	Most things do not apply.	Does not apply at all.	Can't tell if the course applies or not.

3.7 3. Do you feel the JORP course has helped you on the job? 38.7 YES 58.1 NO

WHY? _____

7.5 in other reading tasks? 67.8 YES 24.7 NO

4. Did you have enough time to learn the JORP skills being taught?

2.2 80.6 YES 17.2 NO

4.3 5. If you had your choice, would you lengthen or shorten the course, or keep the course the same length of time:

29.0 Shorten it. How long should it be?_____ (days)

11.8 Lengthen it. How long should it be?_____ (days)

54.9 Keep it the same.

5.4 6. Did the course give you what you expected? 37.6 YES 57.0 NO
What did you expect?_____

_____

_____

18.3 Was it 46.2 ☐ Better or 35.5 ☐ Worse than you expected?

7. How much difficulty have you had with your upgrade training in:

		Almost NONE	A LITTLE difficulty	A LOT OF difficulty	CANNOT DO IT
6.4	Completing CDC materials.	57.0	31.2	4.3	1.1
10.8	Completing OJT proficiency requirements.	65.6	20.4	3.2	0.0
11.7	Adjusting your study habits to a correspondence course type of training	45.2	36.5	5.4	1.1

8. Have you completed your CDC requirements? 78.5 YES 21.5 NO

If YES, when did you complete your CDC?

18.3 70.9 Before 9.7 During 1.1 After taking the JORP training course.

9. How helpful do you think the JORP course will be or has been in completing your CDC requirements?

	8.6	32.3	15.1	9.7	27.9
6.4	Very helpful.	Somewhat helpful.	Did not help, nor did not hurt.	Of little help.	Of no help.

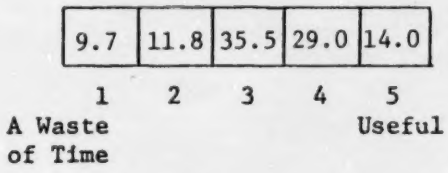
10. Which parts of the JORP training course were useful to you? (Rate each part listed.)

	Parts	Very Useful	Somewhat Useful	Not very Useful	A waste of Time
5.4	1. Narrative Module	20.4	40.9	19.3	14.0
3.2	2. Schematic (Tables, Graphs, & Figures) Module	35.5	40.9	8.6	11.8
4.3	3. Procedural Directions Module	21.5	37.6	23.7	12.9
5.4	4. AF and AFTO Forms Module	38.7	23.7	19.3	12.9
6.5	5. Imaging Exercises	24.7	31.2	19.3	18.3
4.3	6. Classification Table Exercises	33.3	39.8	9.7	12.9
3.2	7. Flow Chart Exercises	33.3	43.0	10.8	9.7
5.4	8. Tools for Learning Workbook	30.1	38.7	10.8	15.0

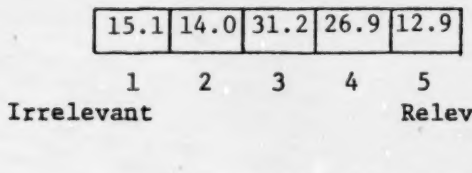
11. Rate the following factors about the JORP Training Course on a scale of 1 to 5, with a #1 being the worst and a #5 being the best that could apply to the factor being rated.

FACTOR

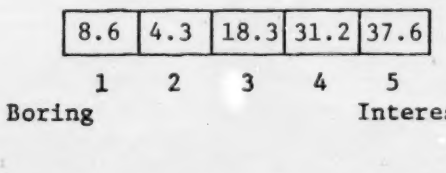
0.0 Reading Skills Being Taught



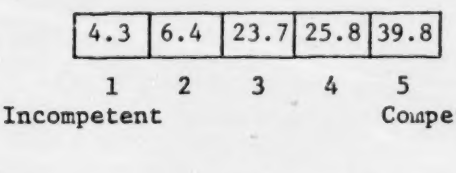
0.0 Training Material Content



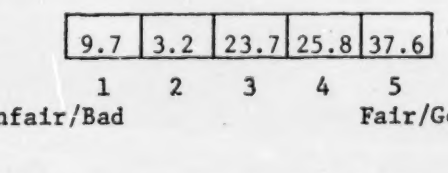
0.0 Teacher's Presentations



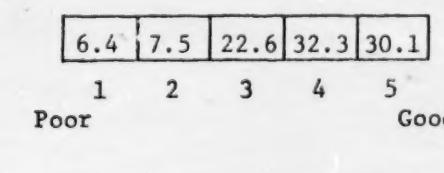
0.0 Teacher Competence



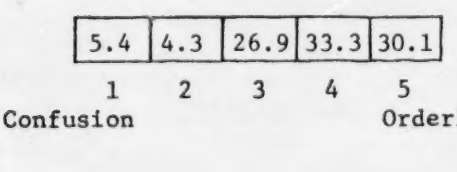
0.0 School Rules



1.1 Facilities



0.0 Classroom Atmosphere



12. Which instructional approach did you like the BEST?

9.7 40.9 Strand I (Job Reading Task Modules) 49.4 Strand II (Imaging, Flow Charts, and Classification Table Exercises)

WHY? (Circle the appropriate one.)

a. Easier
b. Taught me new things.
c. Required less reading.
d. Helps me do my job better.
e. Can be more creative with the task.
f. Other _____

6.4 13. Do you feel the JORP training material was appropriate to your AFSC? 40.9 YES 52.7 NO

WHY? _____

What is your AFSC? _____

6.5 14. Do you think you could have learned more by staying on the job those 2-1/2 hours each day rather than coming to this course?

35.5 YES 58.0 NO

WHY? _____

15. Assume that 2-1/2 hours per day are available for training to increase your ability to do your job. Rank order the following in terms of the most useful way to spend that 2-1/2 hours of training time. (Assign #1 to the most useful, #2 to the next most useful, etc.)

Rank Order	Training Activity
_____	JORP Training Course
_____	Increase Career Development Course (CDC) Study Time
_____	Increased time in Technical School
_____	More Hands-On Equipment Time
_____	General Reading Training Course
_____	Other (Specify and Rank) _____
	_____

16. Which way do you BEST like to get information about something you need to know more about?

12.9

31.2 1. Read about it.

16.1 2. Listen to presentations or talks about it.

33.3 3. Have someone show and tell me about it.

6.5 4. Other (List) _____

17. How would you compare yourself to 9 other people on reading ability?

5.4

8.6 Better than 1

3.2 Better than 2

7.5 Better than 3

12.9 Better than 4

33.3 Better than 5

8.6 Better than 6

8.6 Better than 7

5.4 Better than 8

6.5 Better than all 9

18. At which point do you feel the JORP training is most appropriately given?

11.8

5 4 Prior to Basic Military Training

8.6 During Basic Military Training

21.5 After Basic but before Technical School or Directed Duty Assignment. (DDA).

21.5 Integrated with Technical School Training.

16.1 Upon arrival at first PCS Base.

11.8 Integrated with enrollment in the first Career Development Course (CDC).

3.3 Other (Specify) _____

19. What suggestions would you make to improve the JORP Program _____

_____

20. How confident are you in your ability to read and understand your job reading materials since completing the JORP training?

1.1

16.1	44.1	36.5	0.0	2.2
Much more confident than before.	Somewhat more confident. than before.	About the same as be- fore the course.	Somewhat less confident than before the course.	Much less confident than before the course.

21. How many other AF personnel do you think would benefit from taking JORP training?

3.2

16.1	21.5	37.7	21.5
Nearly Al'	Most	Some	Only A Few

22. Do you feel that it is fair for the Air Force to require people to participate in a program like the JORP?

2.2

12.9	24.7	29.0	20.4	10.8
Very Unfair	Somewhat Unfair	All right	Somewhat Fair	Very Fair

23. What do you feel was the objective of Strand I (Job Reading Task Modules?)

_____

_____

24. What do you feel was the objective of Strand II (Imaging, Flow Charts, and Classification Table Exercises?

_____

_____

25. Did any of the following things happen as a result of taking the JORP course? (Check all that apply.)

YES	NO	
6.5	93.5	I had to work extra hours on the job.
6.5	93.5	I was not released from duty to attend the JORP course (I had to attend on my own time).
9.7	90.3	My shift was changed. What shift was it changed to? _____
3.2	96.8	I had to make up time on the job that I spent in JORP training.
11.8	88.2	I was hassled by my supervisor. What happened? _____

61.3 If you checked any of the above, do you think that this decreased your performance in the JORP course?

YES 11.8 NO 26.9

26. Did you complete a reading improvement course at Travis AFB before taking the JORP course?

5.4

YES 26.9 NO 67.7

STUDENT JORP QUESTIONS WITH COMMENTS

1. Why did you like JORP?

Helped me think	2
Helped me understand my job	11
It got me out of working	1
Helped my reading	12
It was new/different	5
Helped with forms	1
Helped with some things	2

Dislike JORP?

Took up my free time	2
Wasn't about my job	9
Didn't have time to put it to use	1
Waste of time	4
Course needs improving/changing	4
Was too hard	1
Had to pay for this myself	1
Was mandatory	3
Was treated like a child	1
Test time limits too short	2
Didn't teach what I wanted	2
Conflicted with my job	1

3. Why has JORP helped on job?

Helped read & understand	20
Helped with forms	5
Helped with TO's	1
Applies to my job	8
Widens base of knowledge	1
Helps reduce errors by proper interpretation of procedures (a direct quote)	1

Not helped?

Not applicable to job	22
Didn't teach anything new	7
OJT is better	2
I don't read on job	11
Not enough time to learn well	1

6. What did you expect of course?

A reading program	27
A general reading course	4
A job-specific reading course	5

How to get things accomplished/think	3
More learning	1
Speed reading	3
Vocabulary	6
Spelling	2
Promotion	1
College credit	1

13. JORP material appropriate to AFSC?

Had many things about my job	24
Yes, we use books a lot	1
Helped with forms	2
Methods will help later	1
I'm new and need to learn	1
Somewhat	4
Best for 3-level	1

Not appropriate?

Didn't pertain to AFSC	39
We don't need it for job	2
We don't use those forms	1
OJT is better	1
There were errors in mat'l	1
Too AF specifc	1

14. Learn more on job: yes?

Learn better by OJT	20
Course needs improvement	2
Course didn't apply to job	5

Neither:

Both are useful	7
Wasn't during job-was on my own time	2

No?

Job doesn't teach this type of learning	21
Learned to think	1
Class helped reading	12
Learned to keep notes in mind	1
Learned sooner/faster in JORP	2
Learned things for upgrading	1

19. Suggestions to improve JORP.

Add more AFSCs	15
Correct errors in Q's and A's	7
Make it voluntary	2
Lengthen it	4
Lenghten or eradicate test time limits	2
Include spelling	3
Add more instructors/better ones	2
More vocabulary	2
Plan time better	2
More tests and worksheets	1
Add films	1
Don't have it concurrent with CDC	1
Have it deal with CDC	1
Add fiction stories	1
Better classrooms	1
More discussions	2
Shorten it	1
Leave out imaging	1
Leave out drawing	1
Leave out parts that aren't useful	1
Give a better understanding to students	1
Get rid of course	6
"Keep up the good work!"	1

23. What was the objective of Strand I?

To teach student to be able to understand job tasks better through creativity, etc.	49
To read faster and better	8
To see if you can read	3
To see if you can think	4
To help recall previous learning	1
To learn about different jobs	1

24. What was the objective of Strand II?

To use tools or "tricks" to make reading or spoken information more understandable; simpler	31
To be able to separate, analyze, classify, put order to information	13
To be able to find the main idea to remember	7
To plan your job more effectively	4
To learn graphs and charts	1
To learn to think, use your imagination	7
To find out if a student can understand	2
To compare a student's comprehension to that of his peers	1

25. What problems arose due to JORP course?

Had to spend own time for course	3
Supervisor didn't give enough time off	3
Supervisor said student was getting out of working	3
Supervisor wanted student to work overtime	2
Student fell behind in work	1
Student felt peer pressure because of "dummy class"	1

APPENDIX E

SUPERVISOR'S JOB-ORIENTED READING PROGRAM SURVEY

This appendix presents detailed responses to an attitudinal survey of the supervisors of the JORP students. The entire question and its associated scale, and the responses of the sample are shown. The total supervisor sample was 87, since six questionnaires were returned not filled out. Where the question calls for an open-ended answer, responses have been categorized and are shown at the end of this appendix, referenced by question numbers.

SUPERVISOR'S JOB-ORIENTED READING PROGRAM SURVEY

NAME SUPERVISORS OF CLASSES 1-8 N = 87

Supervises Airman

We are trying to evaluate the effects of a new job-oriented reading training course. The above airman was a recent graduate of this course. We ask that you fill out the attached survey honestly, and that your comments really reflect your opinions or feelings about this airman. The information you provide will help us determine how well the new course is meeting the needs of the Air Force and will be kept confidential.

In accordance with paragraph 30, AFR 12-35, Air Force Privacy Act Program, the following information about this survey is provided:

a. Authorities

Title 10 USC, Section 8012, Secretary of the Air Force: Powers and Duties Delegation by; Executive Order 9397, 22 Nov 1943, Numbering System for Federal Accounts Relating to Individual Persons.

b. Principal Purpose

This survey is being conducted to obtain evaluation data on the effectiveness of the Job-Oriented Reading Program (JORP) developed by the Human Resources Research Organization under contract to the Air Force Human Resources Laboratory at Lowry Air Force Base, Colorado.

c. Routine Use

The survey data will be analyzed to provide specific recommendations for program changes in the course prototype. All data will be kept completely confidential.

d. Disclosure

Disclosure is voluntary. No adverse action of any kind may be taken against any individual who elects not to participate in the survey.

USAF SCN 7T24
Sep 1976 thru Dec 1976

Please answer the following questions.

1. How long have you been a supervisor? $\bar{x}$ = 6.7 Years ____ Months

2. How did you feel about releasing this airman to attend the Job-Oriented Reading course at the Base Education Office?

1.2	18.8	23.5	22.4	34.1
Very Negative	Somewhat Negative	Indifferent	Somewhat Positive	Very Positive

WHY? _____

3. How important are reading skills for this airman to perform satisfactorily on the job?

46.0	41.4	11.5	1.1
Very Important	Important	Relatively Unimportant	Not important At All

4. On the average, how much time during the work day is this airman required to do reading tasks (such as using regs or manuals, filling out forms, studying CDCs, etc.) in order to get the job done?

$\bar{x}$ = 3.2 Hours ____ Minutes

5. How often do you or others help this airman with reading and understanding written job materials?

15.3	18.8	18.8	9.4	37.7
Once a Day	3 or More Times a Wk	Once a Wk	Once a Mo	No Help At All

6. Did you notice this airman having reading skill deficiencies before he/she attended the Job Reading training course?

20.7 YES 79.3 NO

If YES, indicate all those which apply. N = 67 responses

4.7 Airman could not use illustrated parts breakdowns

12.5 Airman could not use indexes to locate needed information

4.7 Airman could not use graphs to get needed information

10.9 Airman could not use manuals, regs

3.1 Airman could not use classification tables

14.1 Airman could not use procedural directions

17.2 Airman repeatedly asked for verbal instructions rather than reading them

7.8 Airman repeatedly performed tasks incorrectly after reading TOs or other instructions

4.7 Airman repeatedly failed to follow written instructions prior to attempting a job task

15.6 Airman repeatedly seemed not to understand written instructions for completing a task

1.6 Airman could not read English

3.1 Other _____

7. Have any of this airman's reading skills been improved since his participation in the course?

27.6 YES 5.7 NO 66.7 Didn't notice any difficulty before attending.

If YES, which skill(s)? (See Question #6 if necessary.)

_____

8. Do you feel this airman would have learned more on the job, if the 2 — 1/2 hours per day had been spent there instead of in the course?

35.0 YES 65.0 NO

WHY? _____

9. Have you noticed any improvement in this airman's ability to do the job since completion of the course?

53.6	33.3	13.1
No Improvement	Some Improvement	A Lot of Improvement

If you HAVE noticed improvement, in what areas? (See Question #6.)

_____

10. How much reading trouble is this airman having in completing his CDC materials?

64.2	27.2	7.4	1.2
No Trouble At All	Very Little Trouble	Some Significant Difficulties	A Lot of Difficulty

11. What problem(s) did you have in releasing this airman to attend the course?

(List All) _____

_____

_____

_____

12. Did you get support from your supervisor in releasing this airman for the course?

87.1 YES 12.9 NO

13. How would you compare this airman to nine other airmen on reading ability?

5.1 Better than 1	11.5 Better than 6
5.1 Better than 2	14.1 Better than 7
12.8 Better than 3	14.1 Better than 8
10.4 Better than 4	7.7 Better than 9
19.2 Better than 5	

14. Rate the overall effects of the job-oriented reading training course on this airman's job performance.

3.5	31.8	49.4	15.3
Detrimental to Performance	No Improvement	Some Improvement	Very Much Improved

15. How much supervision does this airman require in:

	Needs NO Supervision	Needs a LITTLE Supervision	Needs AVERAGE Supervision	Needs a LOT OF Supervision	Can't Rate
Doing assigned job tasks?	24.4	38.4	34.9	2.3	0.0
Completing CDC knowledge requirements (CREs, VREs, and CE)?	34.9	26.5	20.5	6.0	12
Completing OJT proficiency requirements (JPGs)?	26.2	35.7	26.2	3.6	8.3

16. Rate this airman's overall performance on the job.

1.2	1.2	4.8	28.6	19.0	21.4	23.8
Unsatisfactory	Marginal	Below Avg	Effective & Competent	Above Avg	Exceptionally Fine	Outstanding

17. Which of the following job reading tasks are critical to the airman's job performance? Responses = 253

9.5 Use of schematics

24.1 Use of procedural direction

11.1 Use of narrative text

28.1 Use of forms

16.2 Use of indexes

5.5 Use of graphs

5.1 Use of classification tables

0.4 None

18. Have you noticed job reading materials that are particularly troublesome to most airmen? YES 71.1 NO 29.9

If YES, indicate those which you have noticed. 40.9 TOs

40.9 Manual, regs

12.5 Forms

5.7 Letters

19. Would you expect the Job-Oriented Reading Program to have any impact on your unit's ability to get the job done?

62.7 YES 37.3 NO

Specifically, what impact?_____

_____

20. In your experience, to what extent have you found reading difficulties of airmen to be a problem in completing upgrade training requirements?

21.8	39.1	32.2	6.9
A Great Deal	Some	Very Little	None At All

21. If you had a choice, would you release another airman to attend the Job-Oriented Reading course?

33.3	48.3	12.6	5.8
Definitely YES	Probably YES	Probably NOT	Definitely NOT

22. Have you personally recommended other airmen for reading training in the past?

17.2 YES 82.8 NO

If YES, how many? _____

23. Have you ever attended a reading improvement course yourself?

25.3 YES 74.7 NO

If YES, describe it. _____

_____

24. When do you feel that the job-oriented reading training is most appropriately given to airmen with reading difficulties?

3.9 Don't know

6.5 Prior to Basic Military Training

24.7 During Basic Military Training

29.8 After Basic but before Technical School or Direct Duty Assignment (DDA)

23.4 Integrated with Technical School Training

1.3 Upon arrival at first PCS Base

6.5 Integrated with enrollment in the first Career Development Course (CDC)

3.9 Other (Specify)_____

JORP SUPERVISOR SURVEY

QUESTION	RESPONSES	N
2. How did you feel about releasing this Airman to attend the JORP course? Why	Positive	
	Student needed reading training.	11
	Self-improvement is good.	11
	Reading skills are important.	5
	Education of any kind is good.	2
	It helps with CDC.	1
	Negative	
	Student didn't need reading training.	8
	Unit was understaffed.	12
	If student couldn't learn reading in 12 years, he can't in 6 weeks. (Supervisor didn't know what JORP was all about.)	1
	Indifferent	
	Don't know if student needed reading training.	2
	Don't know about course content.	1
7. Which skills improved?	Overall reading comprehension.	19
	Reading of instructions.	1
	Identifying whole sentences.	1
	Speed.	2
8. Would airman have learned more on job than in JORP course? Why?	Yes	
	Airman didn't need the course.	11
	Airman needed OJT.	15

QUESTION	RESPONSE	N
	No	
	Airman needed reading training.	6
	You can pick up more (different) things) in a class.	15
	Better training atmosphere in class.	10
	Job reading is beneficial to all.	3
9. What areas of improvement?	Manuals	2
	TOs	3
	Forms and Charts	4
	Regs	2
	Overall job materials	2
	PDs	6
	General reading skills	7
	Less supervision necessary	3
	Less errors	3
	More self confidence	2
	Better at taking tests	1
	"Less talk, more reading."	1
11. What problems did you have in releasing airman for course?	Understaffed, loss of man hours	22
	Timing was a problem.	8
	Loss or hindrance of OJT.	
	Loss of unique position/duties.	4
	Airman took advantage of time off.	1
19. Would you expect JORP to have impact on unit?	Positive Impact	
	If some personnel were poor readers.	5
	Need RDC and COMP to work well.	20
	Better understanding of manuals.	12

QUESTION	RESPONSES	N
	Less errors.	1
	Better understanding of abilities.	1
	Good impact on upgrade training.	1
	Better, clearer writing.	1
	Negative Impact	
	Releasing airman hanpers section.	2
	Man is away from OJT too long.	1
13. Describe your reading improvement course.	AF course - unspecified	5
	College course	1
	Speed reading	5
	High school/college prep	2
	Jr. high	1
	Self-taught	2
	ESL course	1

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